APPENDIX A

ASSEMBLY DRAWINGS

APPENDIX A.

ASSEMBLY DRAWINGS

A.1 INTRODUCTION

Appendix A contains component locator assembly drawings; this includes Circuit Card Assembly (CCA) drawings and system equipment rack configurations. Jumper/strapping physical locations are shown in **Figures A-1** through **A-16**. These drawings show the locations of all jumper components actually installed on the board and indicate which jumpers are not used (as well as those physically installed, but not used). **Figures A-1** through **A-16** (titles listed below) also show physical locations of selected switches and potentiometers used in various maintenance procedures. The switches include those shown in the jumper/strapping tables of Section 5 and which require special settings; these are also highlighted on the drawings where applicable. The highlighted front panel potentiometers (i.e., XMT ADJ and RCV ADJ) are used only in the alignment procedures for the telephone cards to adjust the transmit and receive amplifier gain.

Note that the part numbers listed in the table on page 6-170 in almost all cases are circuit card assembly (CCA) kit numbers (vice the 120xxx-xxx numbers that appear on the card assembly drawings in Appendix A). The boards that have CCA kit numbers associated with them have unique, discrete firmware associated with them and, therefore, are designated as "kits" with 325xxx-xxx series numbers. **Table 1-3** lists both the "kit" number and the card assembly number for each CCA. The firmware determines, at least in part, the operational configuration of the boards with which it is associated.

Figure No.	Title
A-1	Jumper/Switch Locations: TMU
A-2	Jumper/Switch Locations: CMU
A-3	Jumper/Switch Locations: Phone Conferencer with Differential
A-4	Jumper/Switch Locations: PBX, 2-Wire Line Card (Telephone Interface)
A-5	Jumper/Switch Locations: PBX, 4-Wire Line Card (Telephone Interface)
A-6	Jumper/Switch Locations: ASU Line Card (Telephone Interface)
A-7	Jumper/Switch Locations: E&M Line Card (Telephone Interface)
A-8	Jumper/Switch Locations: Maintenance Access Unit

Figures A-17 through **A-20** depict the equipment rack assemblies for the four ETVS basic configurations, BS-1 through BS-4. These drawings show physical locations of all system equipment assemblies including card cages, power supplies, computers (i.e., Gateways), junction boxes, system alarm panels, low-voltage disconnect units, reserve power storage batteries, card slots, distribution panels, maintenance positions, ESD grounding panels, fuse panels, etc. as well as rack blank panels, louvered panels, outlets, etc. These drawings show front, side, and rear views (one with door opened for clarity). Mounting details are generally the same for all system configurations, basically differing only in the quantities, types, and locations of units installed. **Figures A-21, A-22,** and **A23**, respectively, show views of other ETVS assemblies—Remote Power Rack, TED maintenance position, and TED hinged and wedge assemblies.

Figures A-21 and **A-22**, respectively, are views of the optional full height power rack and TRACON TED maintenance position calling out salient features. **Figure A-23** is a composite view showing upper/lower, right-hand/left-hand TED TRACON wedge configurations and hinged TED configuration for Tower use.

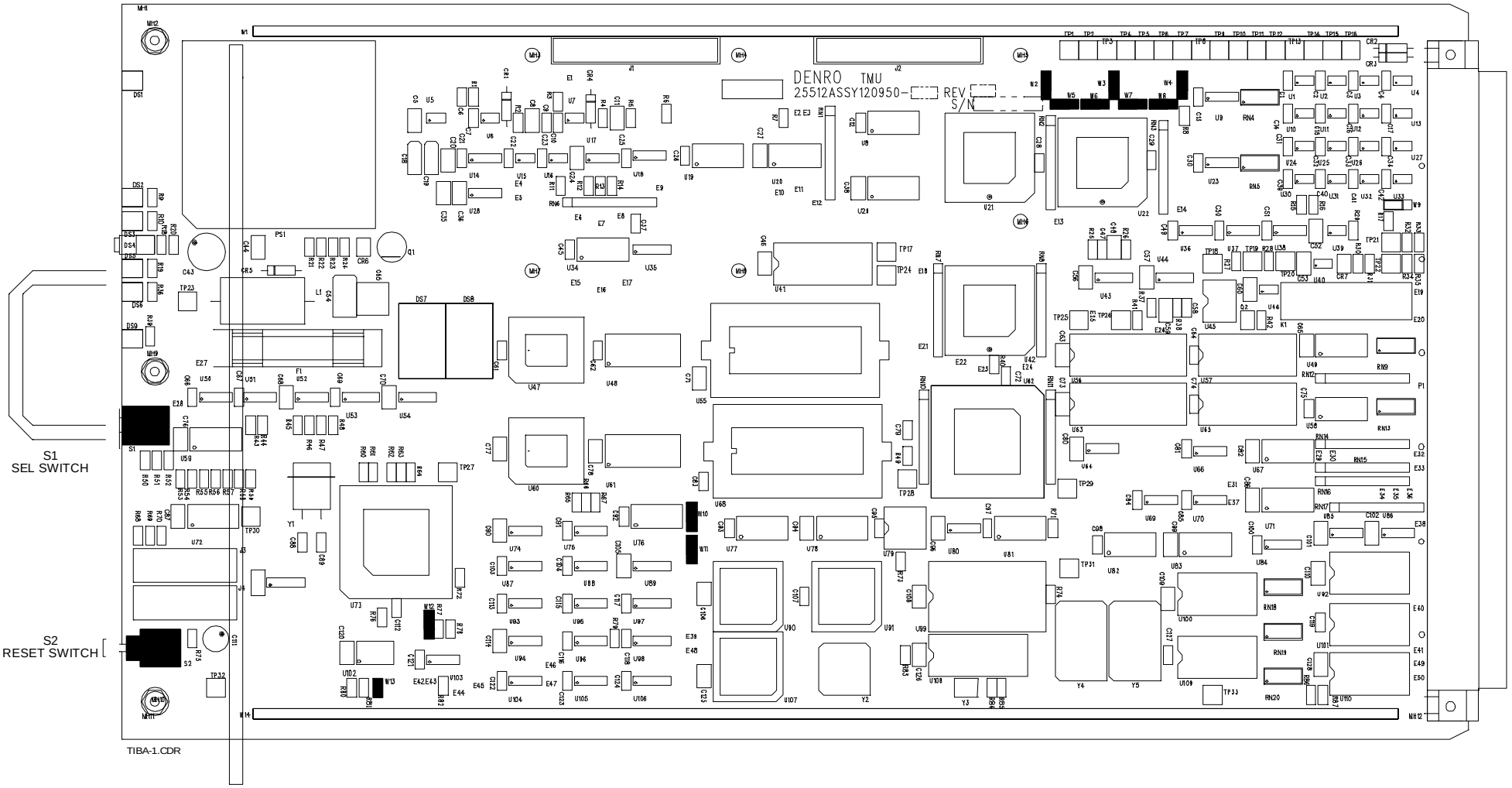
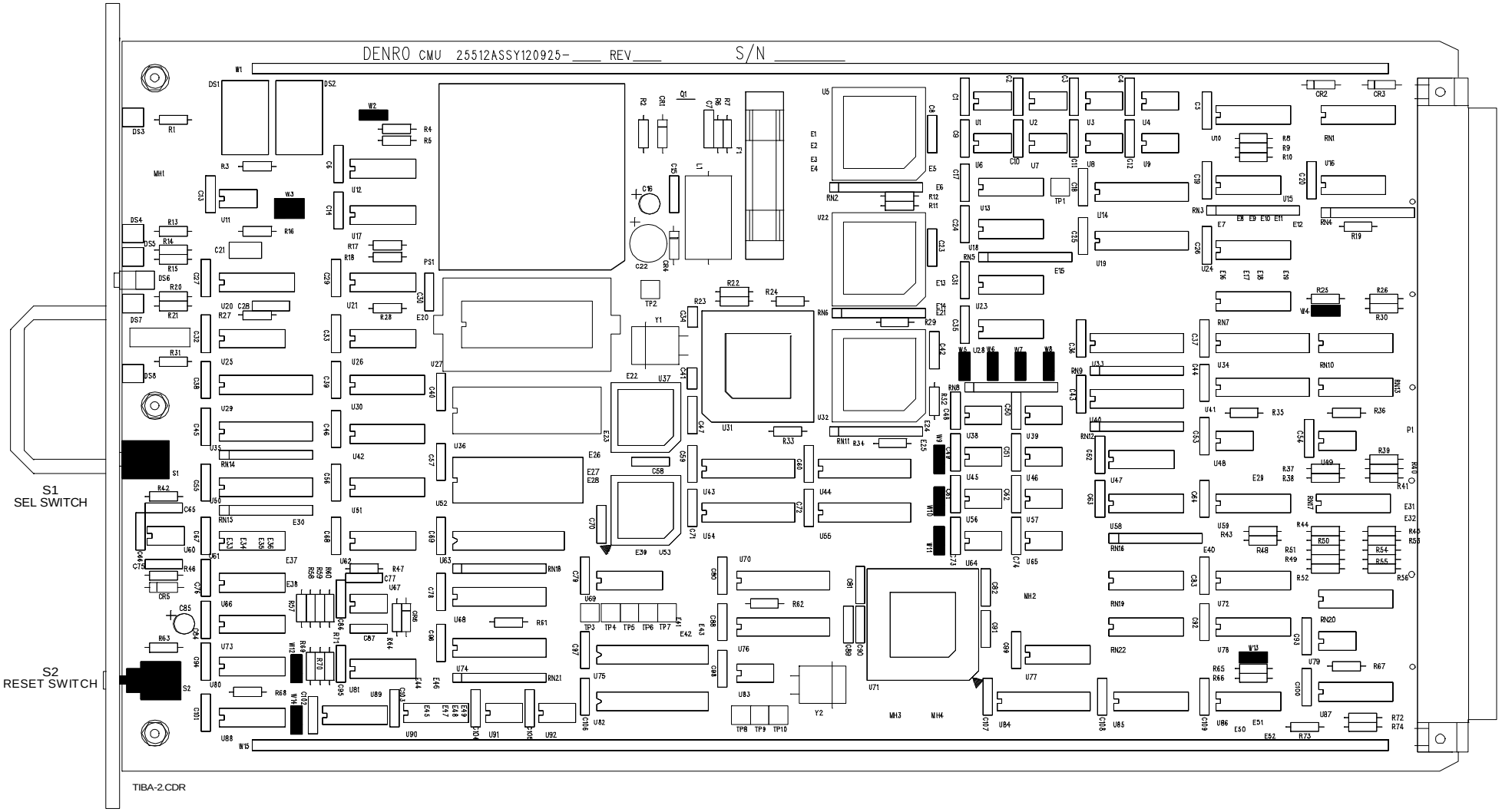


Figure A-1. Jumper/Switch Locations: TMU

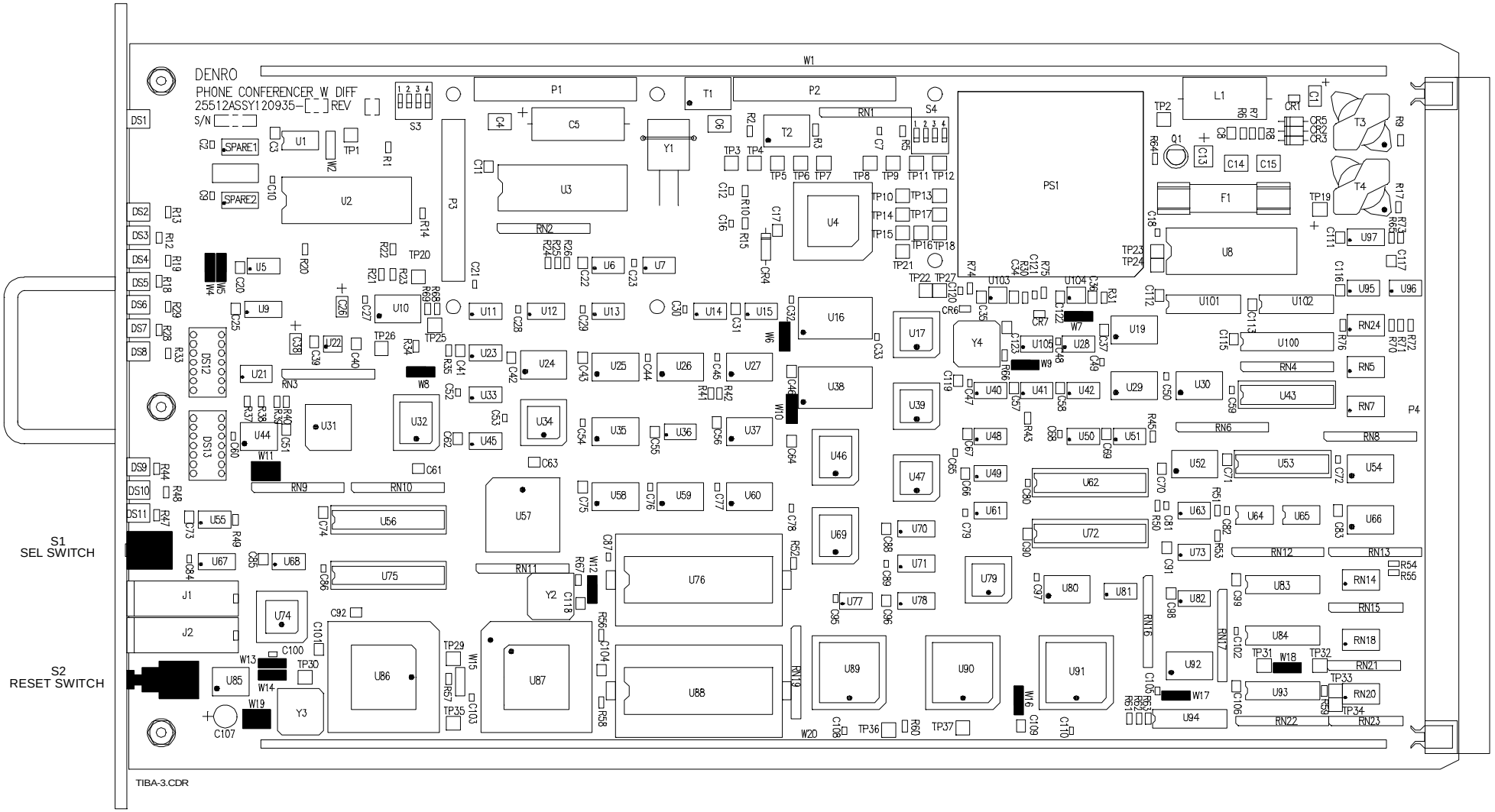
NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W1 AND W14 USED AS STIFFENERS, W8 THRU W11 NOT USED.



NOTES:

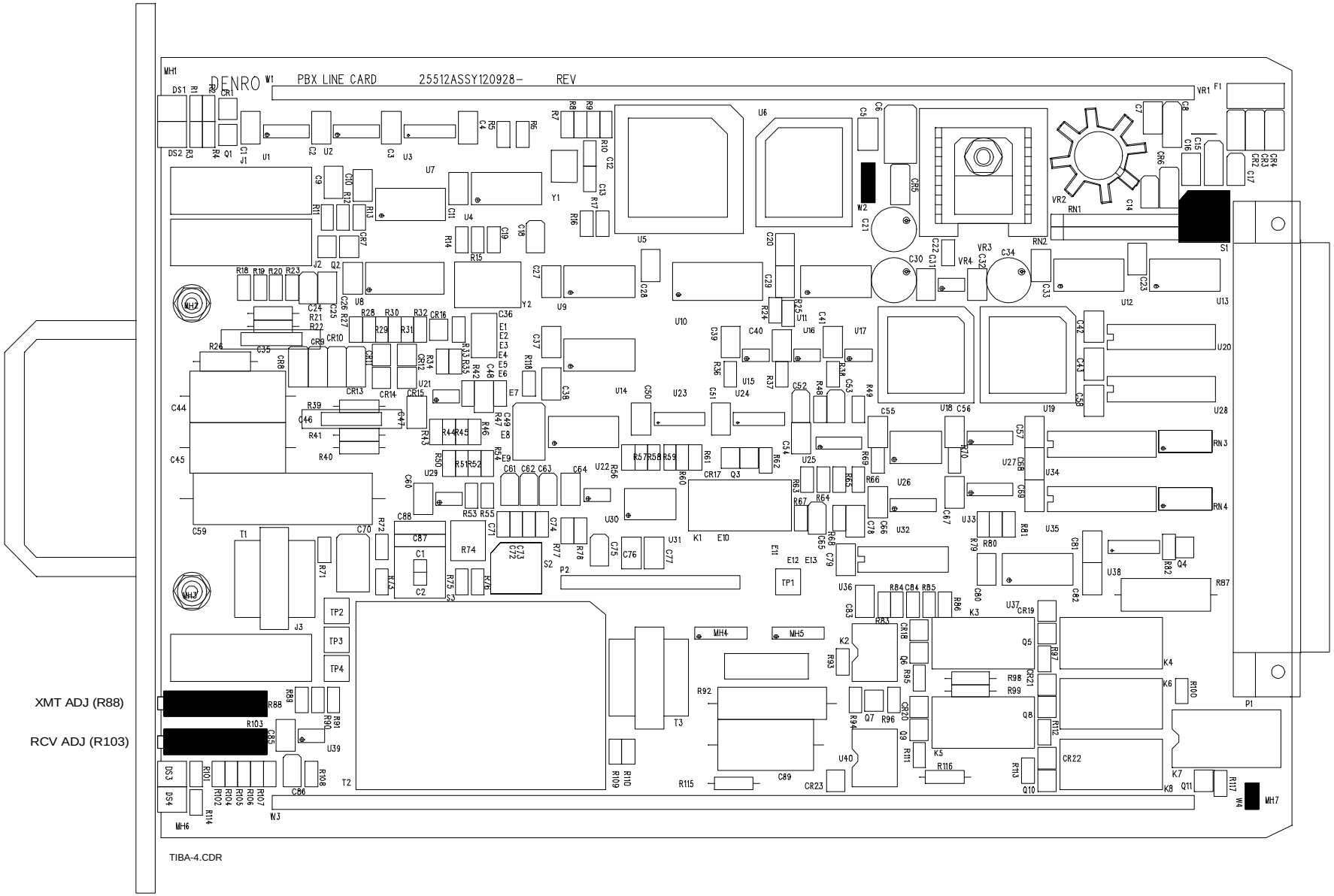
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W1 AND W15 USED AS STIFFENERS, W4, W8 AND W12 THRU W14 NOT USED.

Figure A-2. Jumper/Switch Locations: CMU



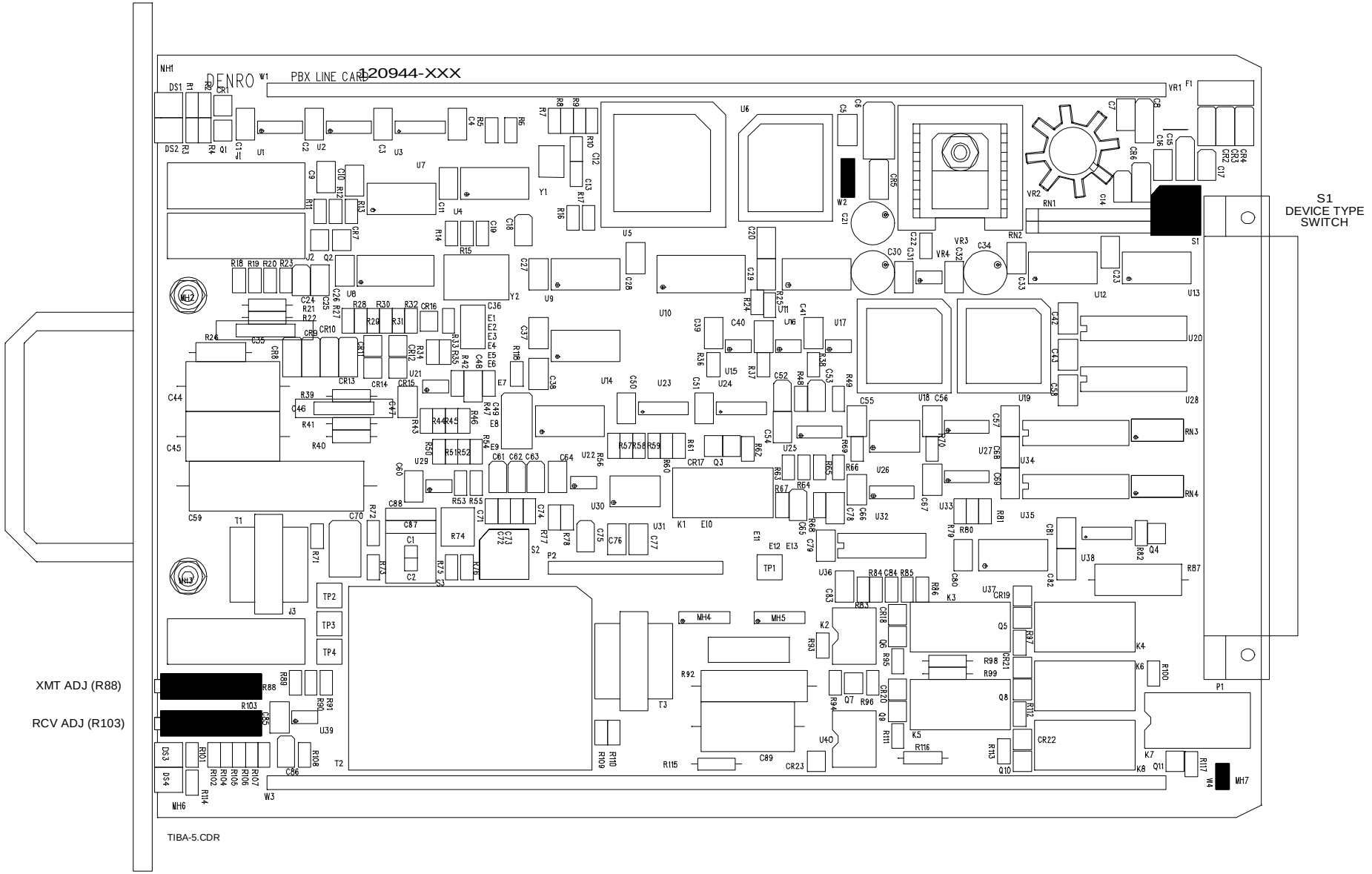
NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W1 AND W20 USED AS STIFFENERS. W2, W3 AND W15 NOT USED.

Figure A-3. Jumper/Switch Locations: Phone Conferencer with Differential



NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES AND SELECTED POTENTIOMETERS.
2. W1 AND W3 USED AS STIFFENERS. W2 NOT USED.
3. W4 USED AS "TCG TO GND".

Figure A-4. Jumper/Switch Locations: PBX, 2W (Telephone Interface)



NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES AND SELECTED POTENTIOMETERS.
2. W1 AND W3 USED AS STIFFENERS. W2 AND W4 NOT USED.

Figure A-5. Jumper/Switch Locations: PBX, 4W (Telephone Interface)

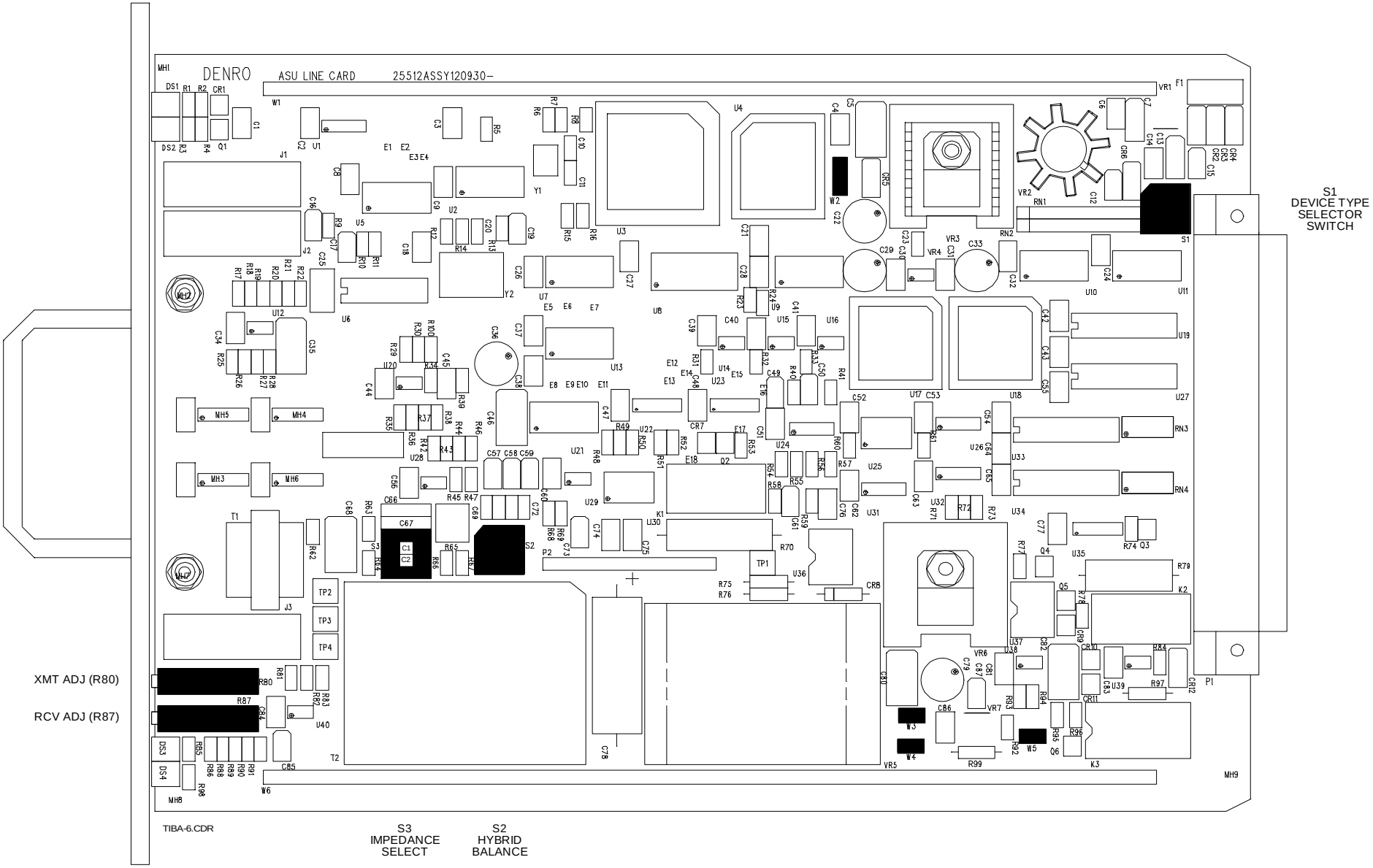


Figure A-6. Jumper/Switch Locations: ASU Line Card (Telephone Interface)

NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES AND SELECTED POTENTIOMETERS.
2. W1 AND W6 USED AS STIFFENERS. W2 NOT USED.

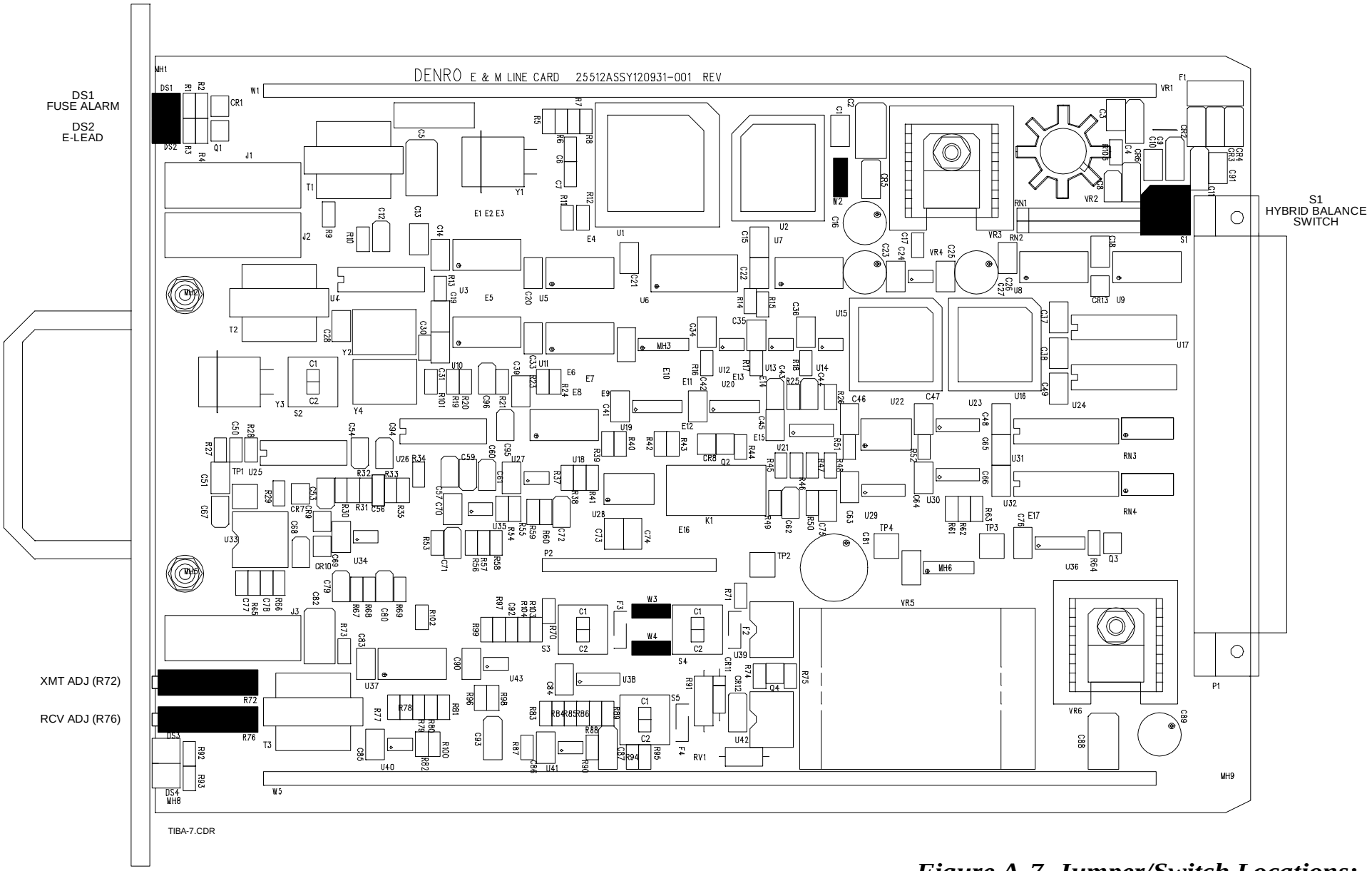
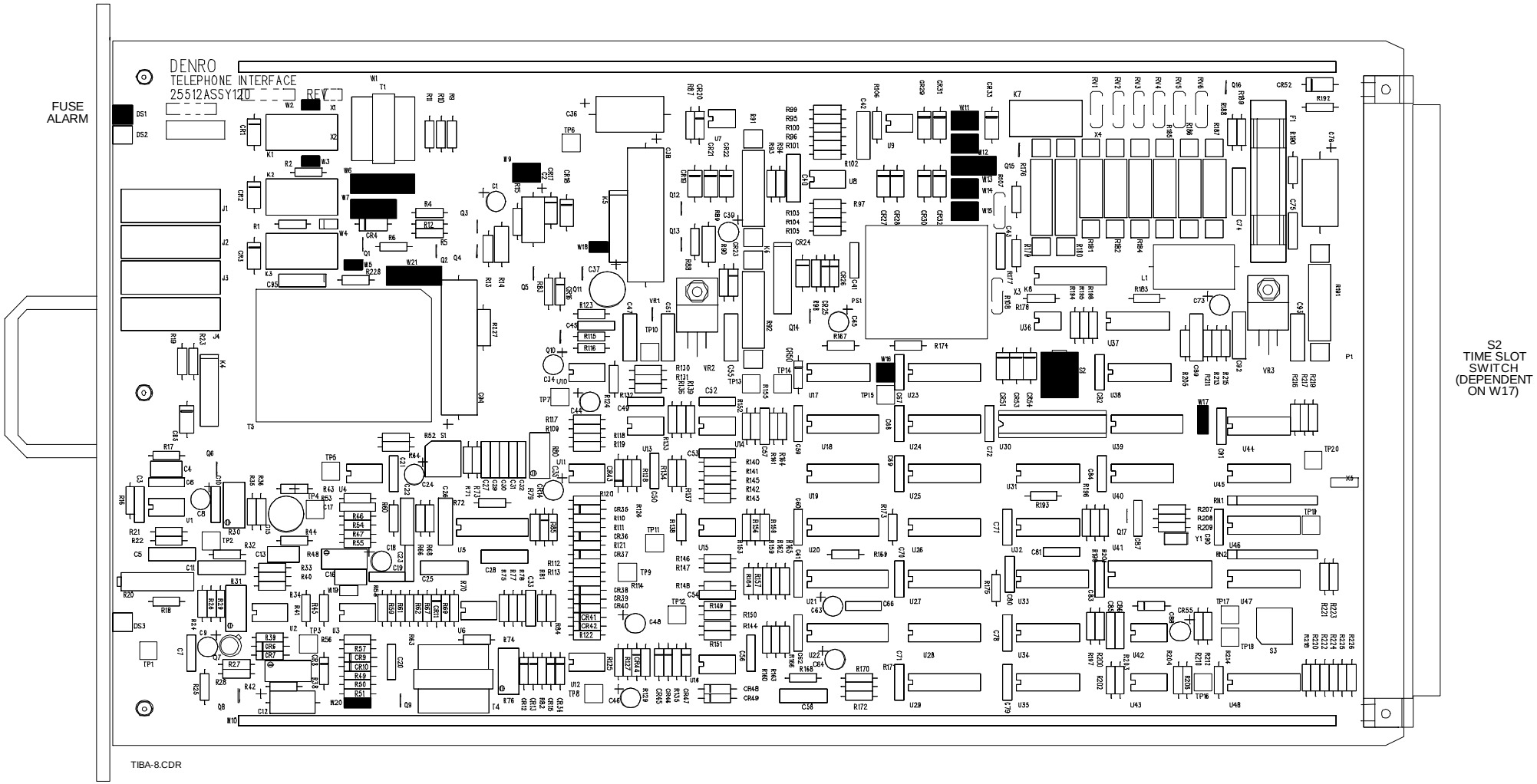


Figure A-7. Jumper/Switch Locations: E & M Line Card (Telephone Interface)

NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W1 AND W5 USED AS STIFFENERS. W2 NOT USED.



NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W1 AND W10 USED AS STIFFENERS. W2 THRU W5, W17, W18, W20 AND W21 ARE USED. W6 THRU W16 AND W19 ARE NOT USED.

Figure A-8. Jumper/Switch Locations: Maintenance Access Unit

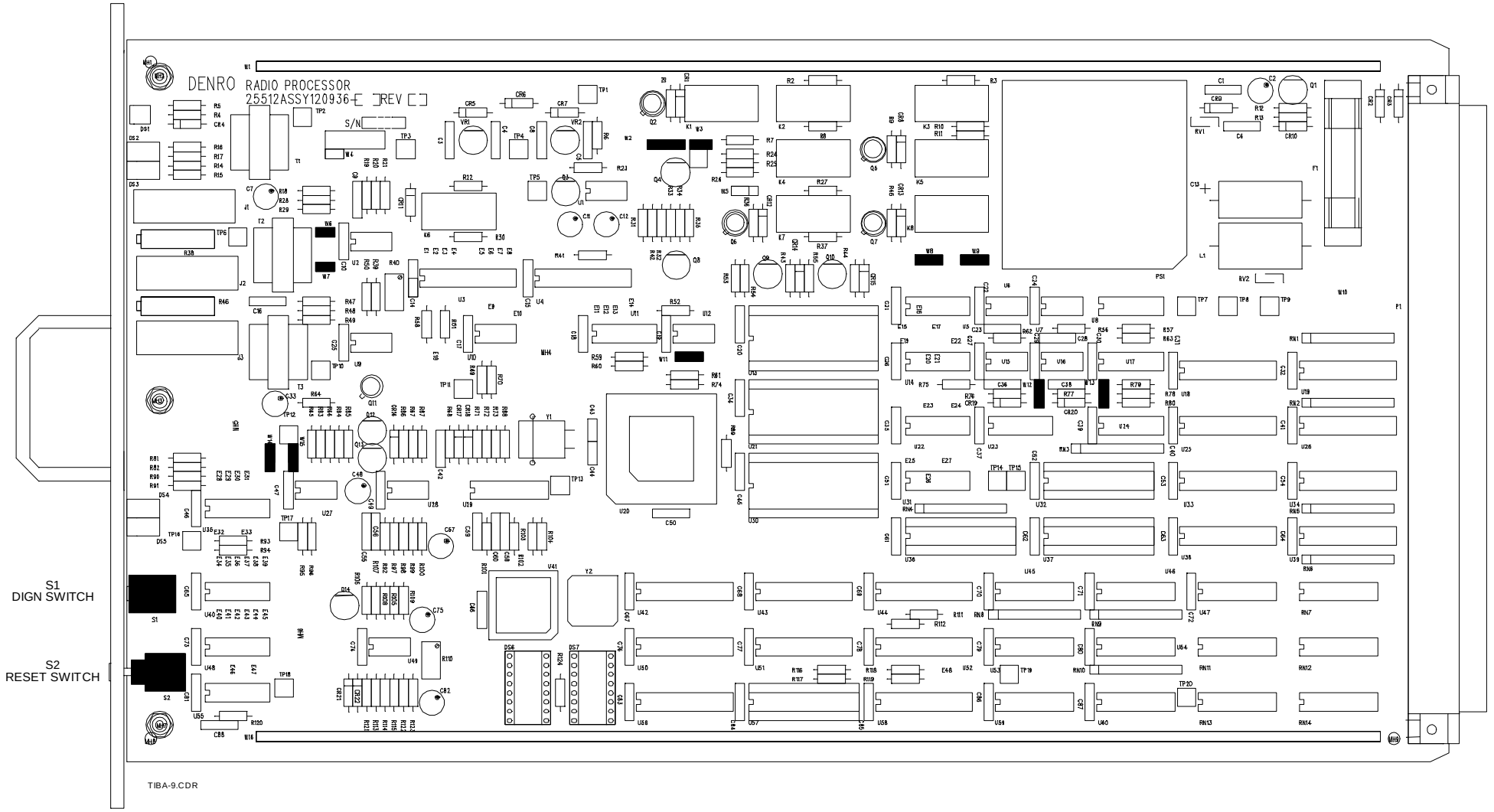
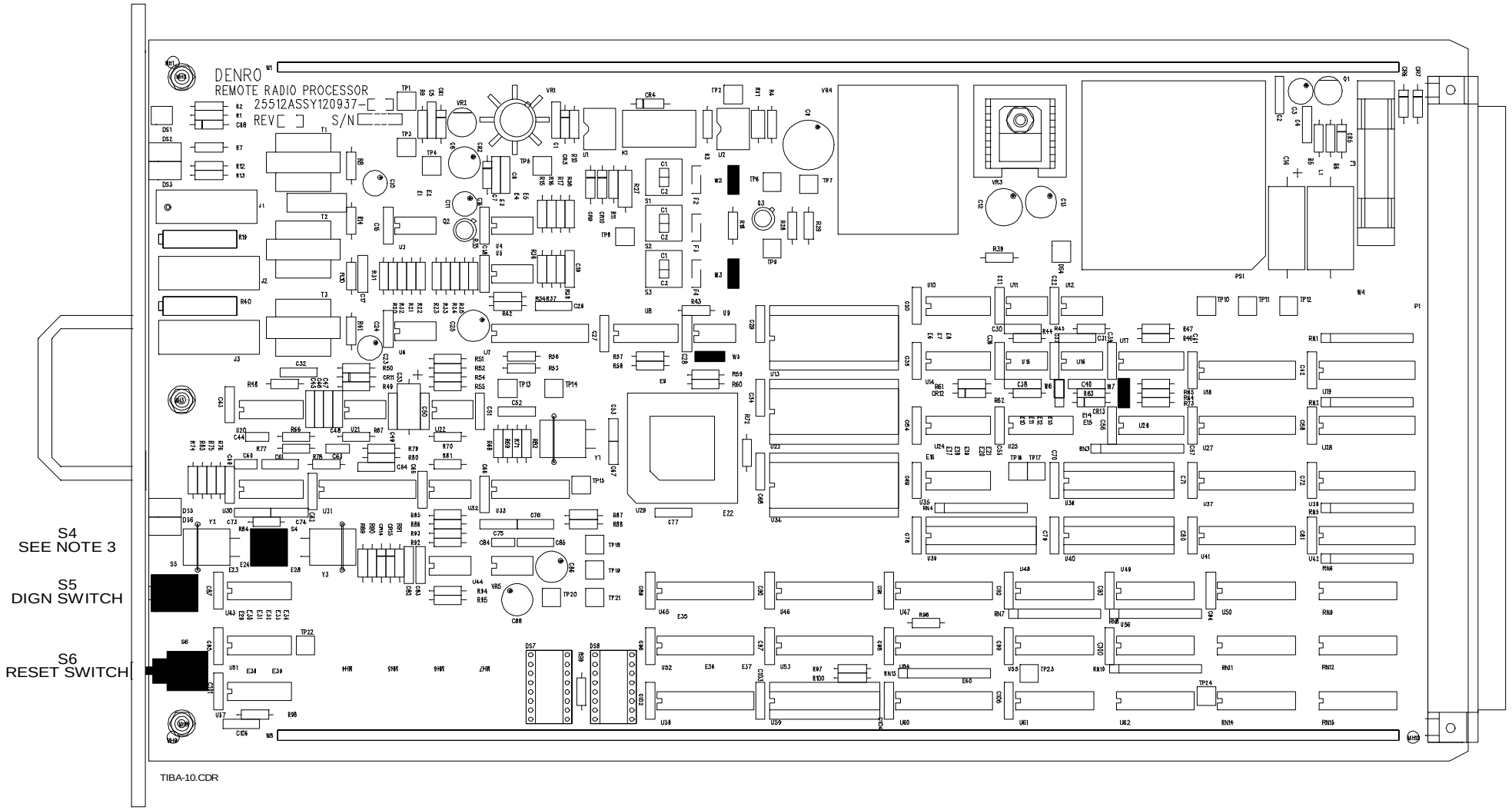


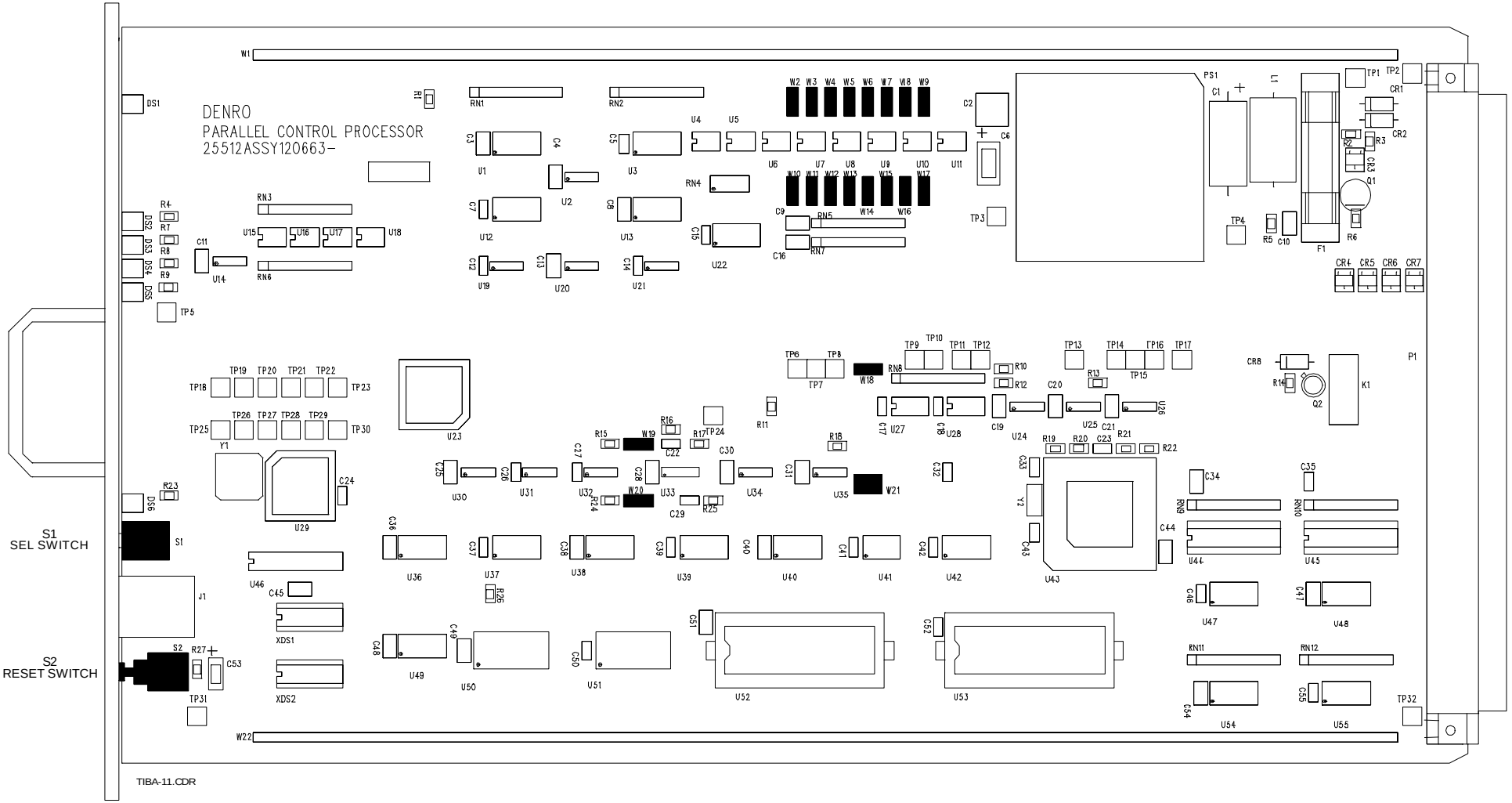
Figure A-9. Jumper/Switch Locations: Radio Processor

NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W1 AND W16 USED AS STIFFENERS, W10, W12, W13 & W14 NOT USED.



NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W1 AND W8 USED AS STIFFENERS, W4, W6 AND W7 NOT USED.
3. S1 THRU S5 USED IN STRAPPING (SEE TABLE 5-21, SECTION 5).

Figure A-10. Jumper/Switch Locations: Remote Radio Processor



NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W1 AND W22 USED AS STIFFENERS. W2 THRU W17 (OUTPUT BITS 00-07)

Figure A-11. Jumper/Switch Locations: Parallel Control Processor

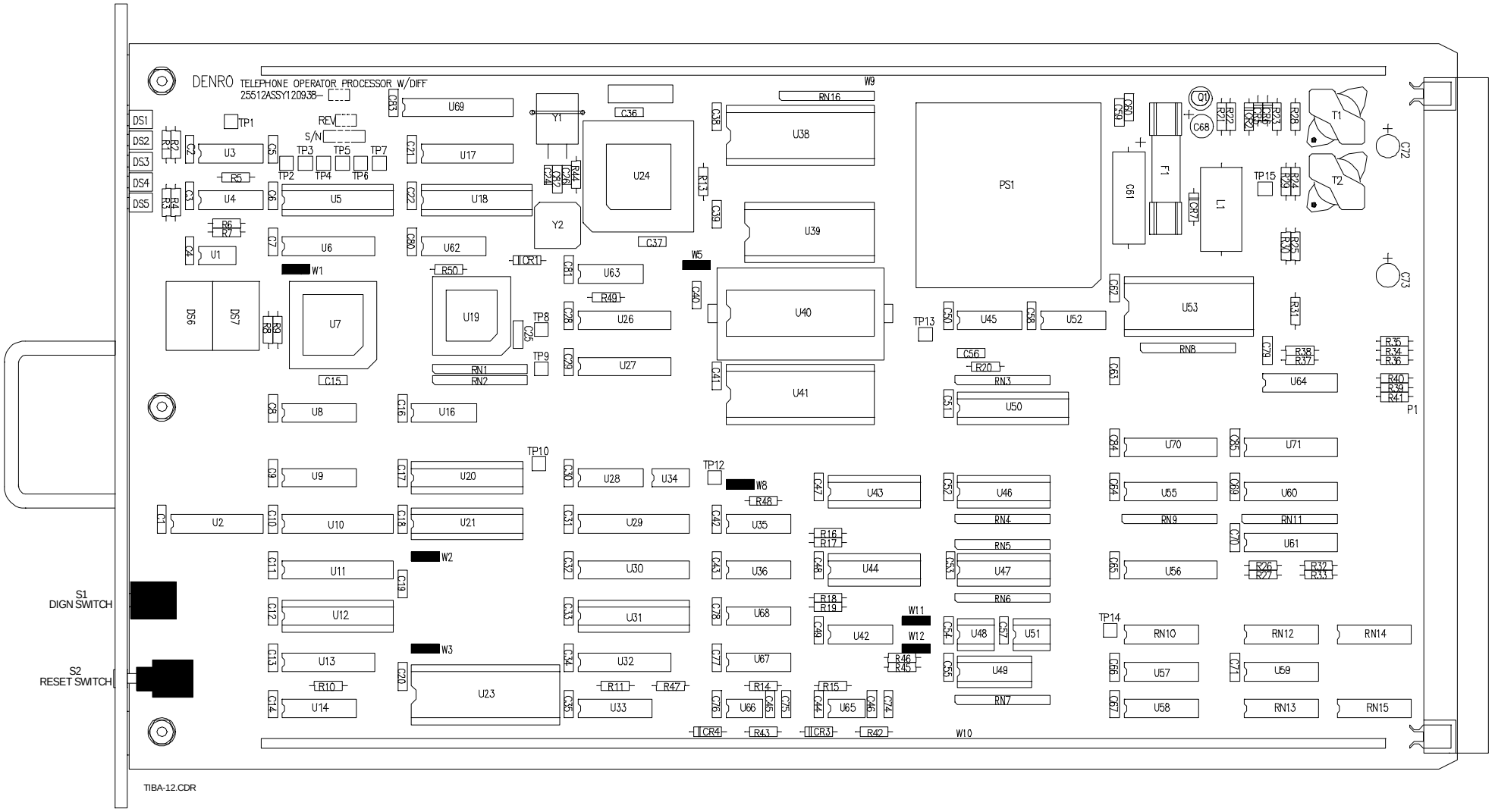


Figure A-12. Jumper/Switch Locations: Operator Processor with Differential (25Mhz)

NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W9 AND W10 USED AS STIFFENERS. W2, W4, W6, W7, W11 AND W12 NOT USED.
3. NOTE SUPERVISOR RECORD CCA JUMPER/SWITCH LOCATIONS SAME AS FOR THIS CCA.
4. T3, T4, U54, AND U22 NOT INSTALLED (SEE FIGURE A-13).

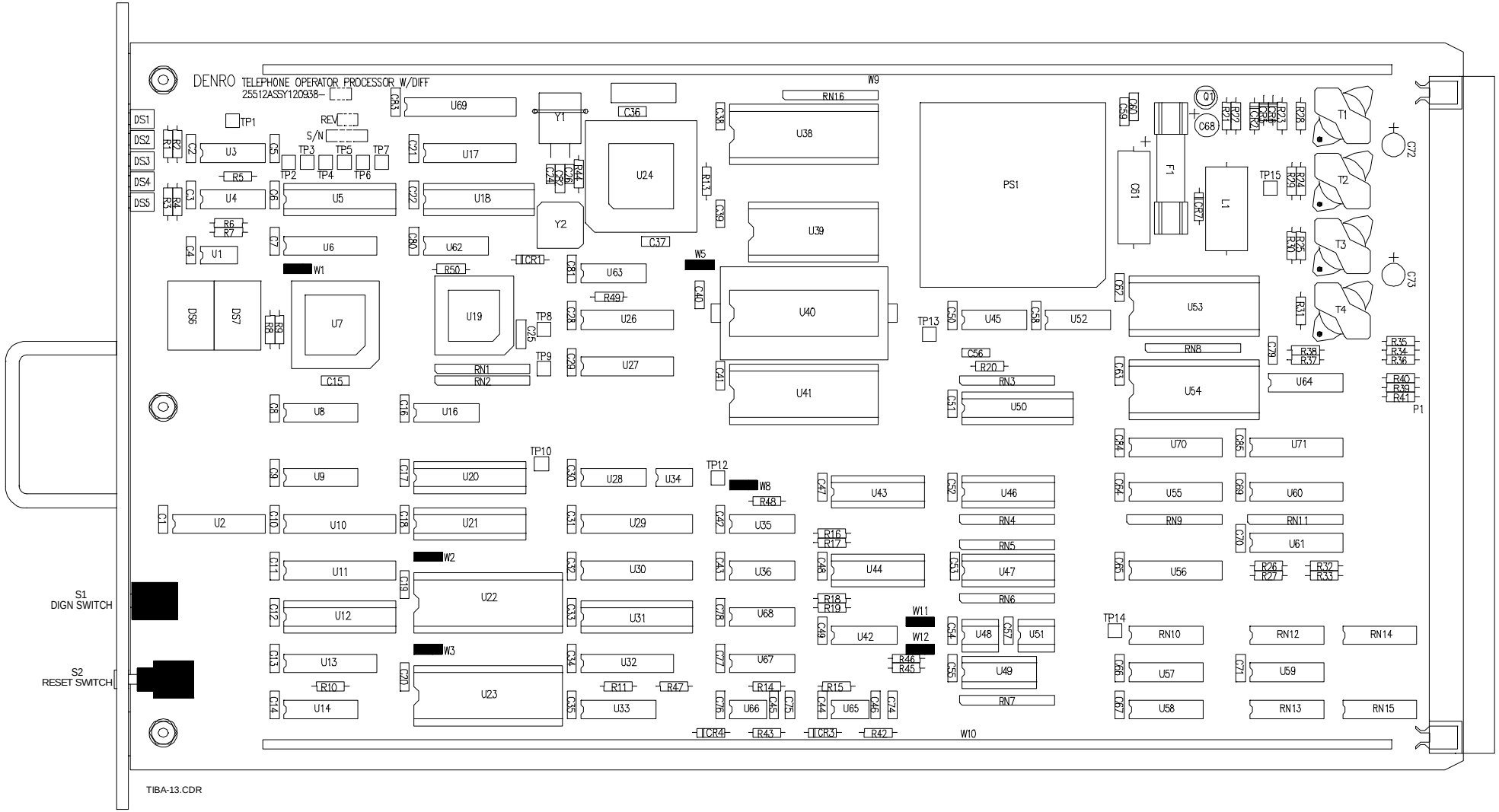
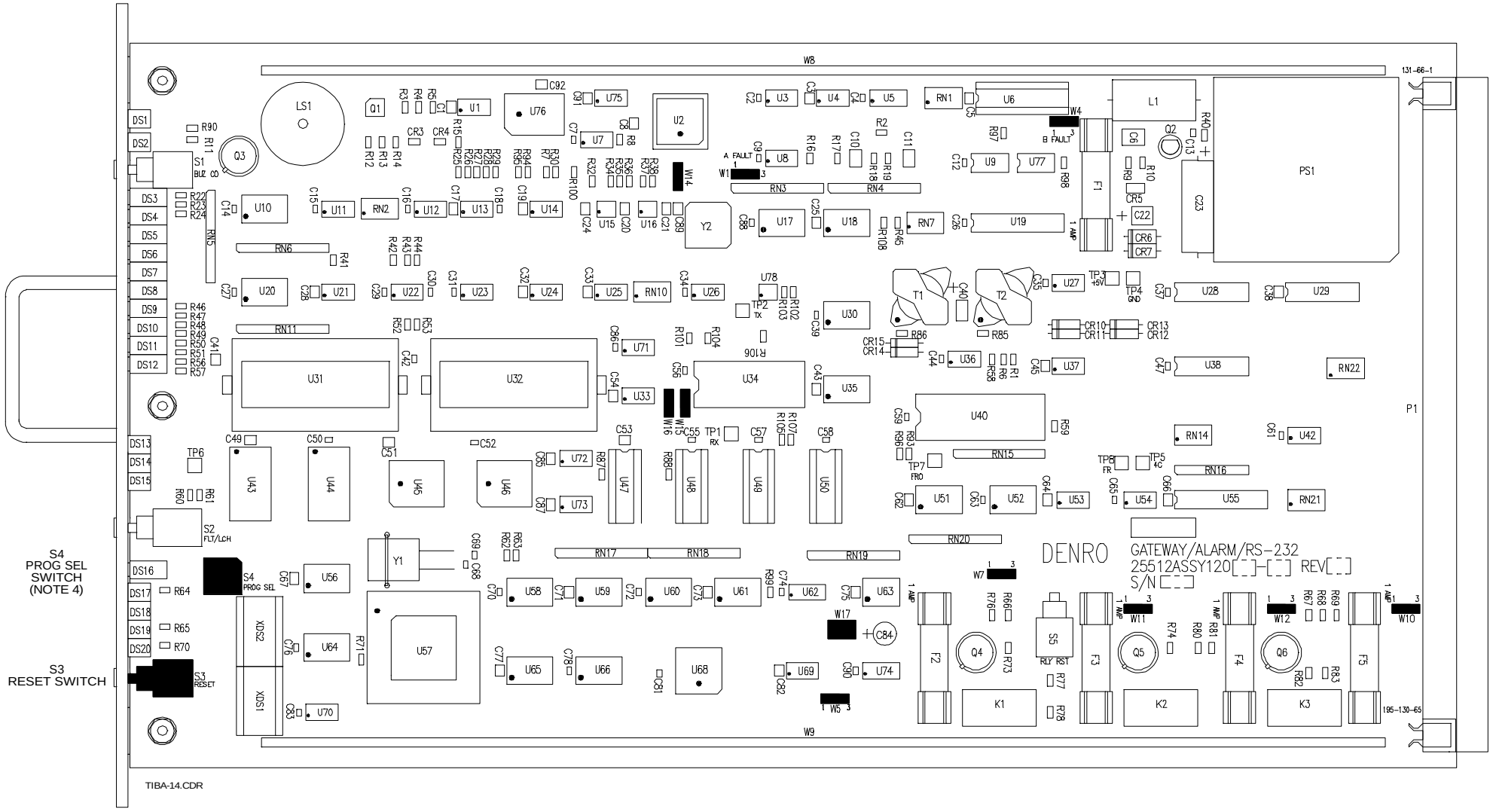


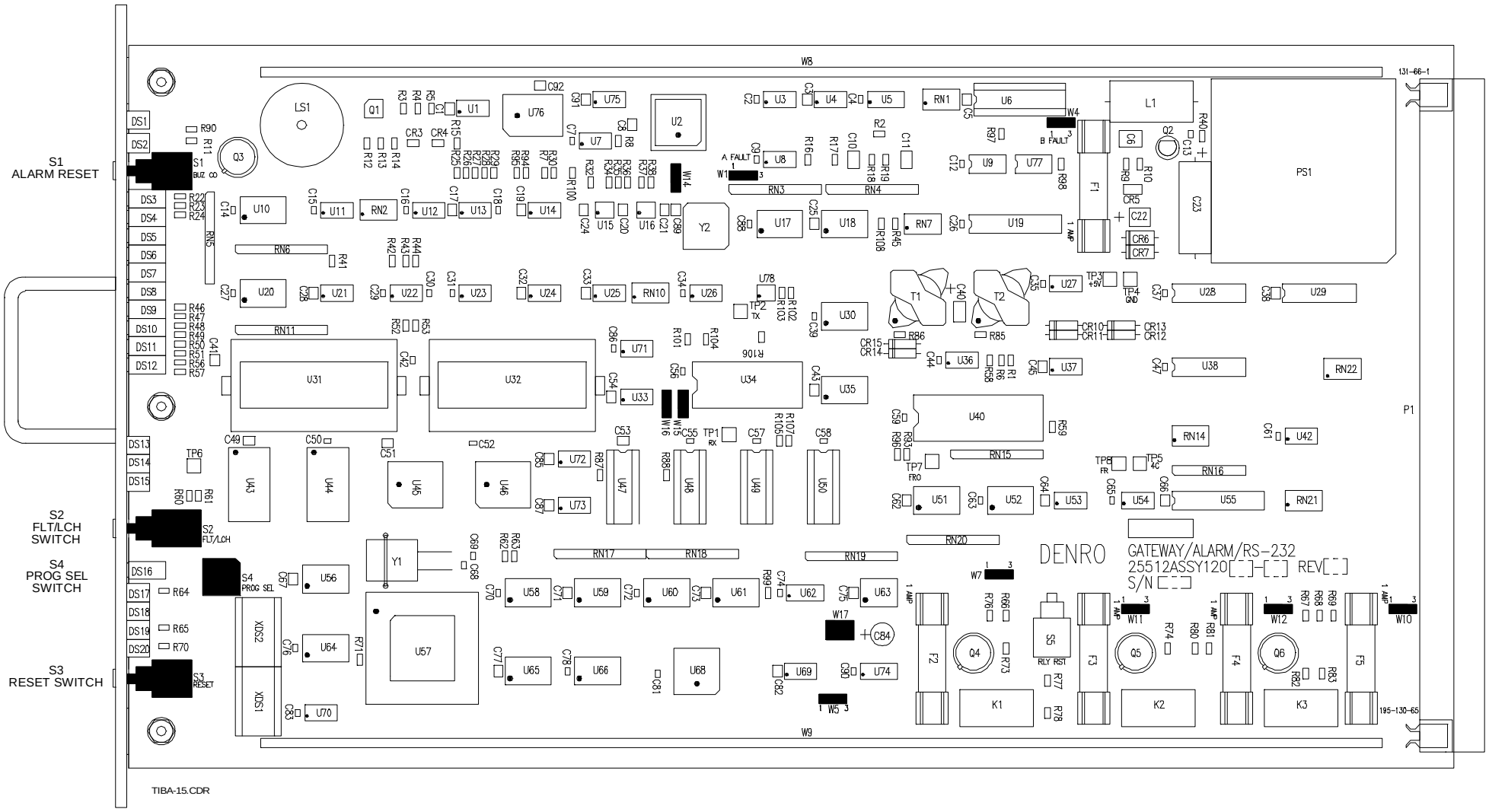
Figure A-13. Jumper/Switch Locations: Operator Processor Split with Differential (25Mhz)

NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W9 AND W10 USED AS STIFFENERS. W4, W6, W7, W11 AND W12 NOT USED.
3. W2 USED ON THIS CARD ASSEMBLY FOR 2048K DEFAULT SETTING.



NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W8 AND W9 USED AS STIFFENERS. W2, W3, W6 THRU W13, S1, S2, AND S5 NOT USED.
3. THIS CARD USED AS 120671-005 (GATEWAY INTERFACE) AND 120674-006 (ALARM UNIT).
4. W1 = A FAULT, W4 = B FAULT.

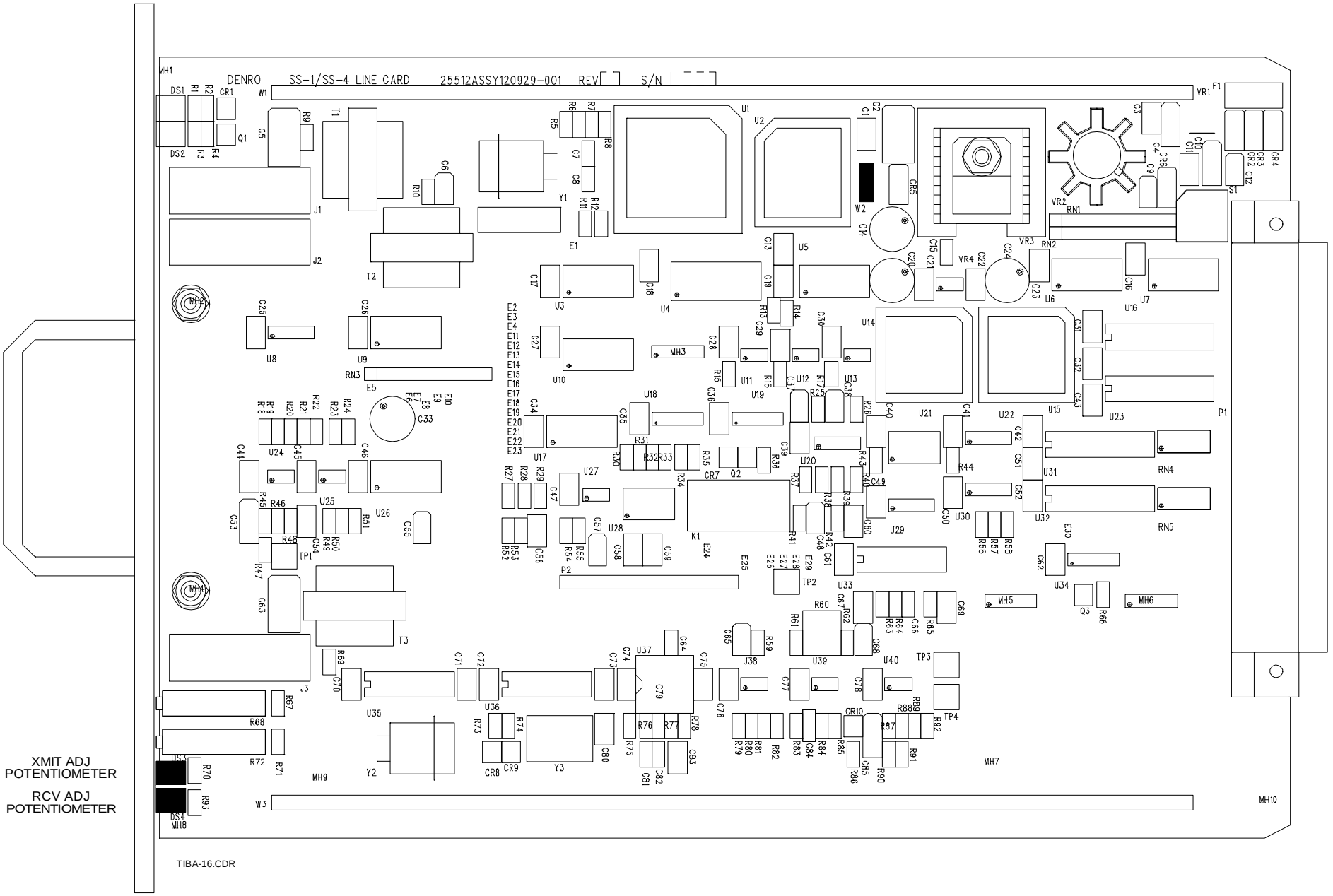
Figure A-14. Jumper/Switch Locations: Gateway Interface



NOTES:

1. SHADED ITEMS IDENTIFY JUMPERS AND SWITCHES.
2. W8 AND W9 USED AS STIFFENERS. W2, W3, W6, W8 THRU W13 NOT USED.
3. THIS CARD USED AS 120671-005 (GATEWAY INTERFACE) AND 120674-006 (ALARM UNIT).

Figure A-15. Jumper/Switch Locations: Alarm Unit



NOTES:
1. SHADED ITEMS IDENTIFY JUMPERS, SWITCHES AND POTENTIOMETERS.
2. W1 AND W3 USED AS STIFFENERS. W2 NOT USED.

Figure A-16. Jumper/Switch Locations: SS-1/SS-4

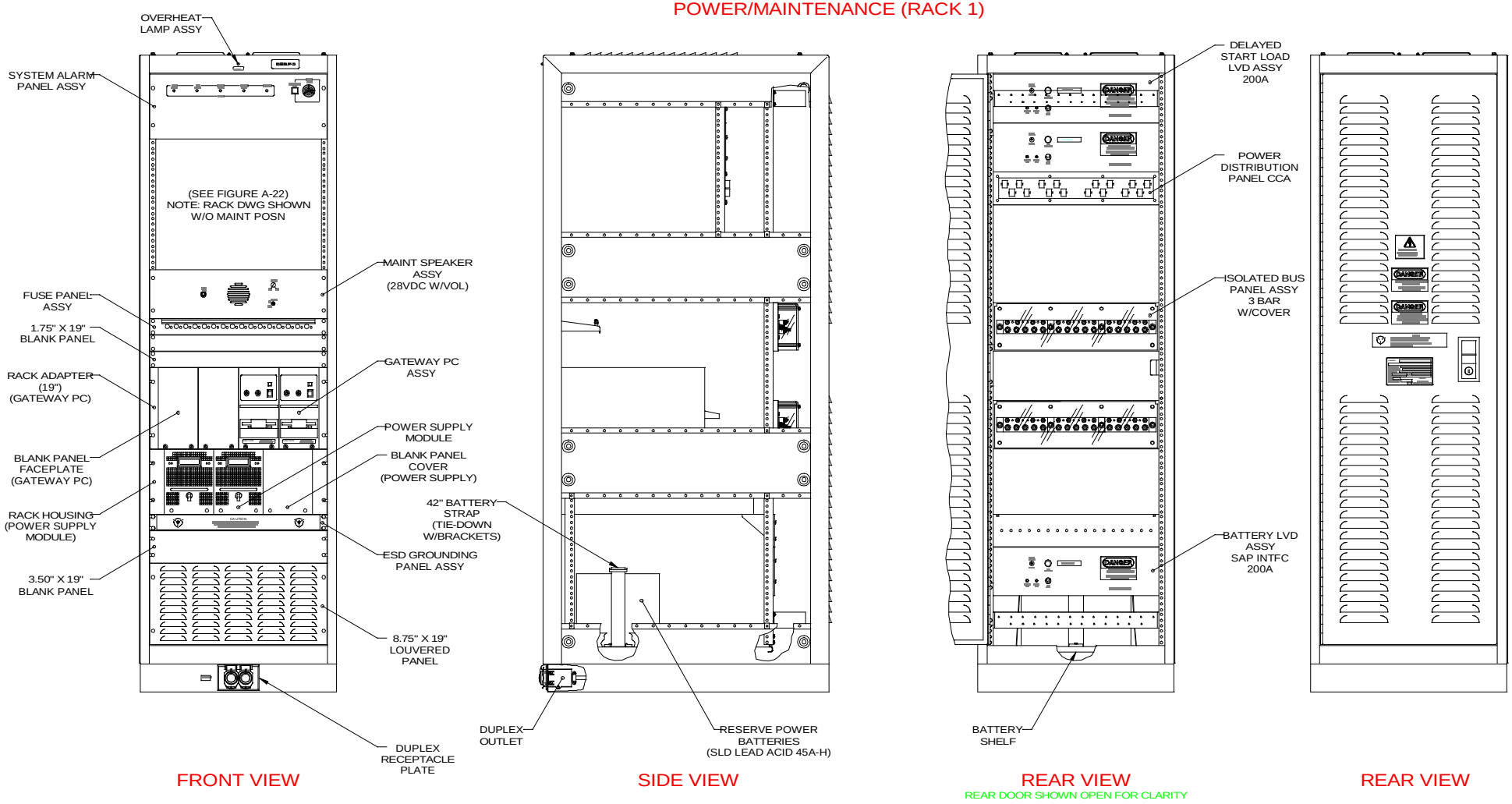


Figure A-17. Basic ETVS System 1 (BS-1); Racks 1 and 2; Front, Side, and Rear Views (Sheet 1 of 2)

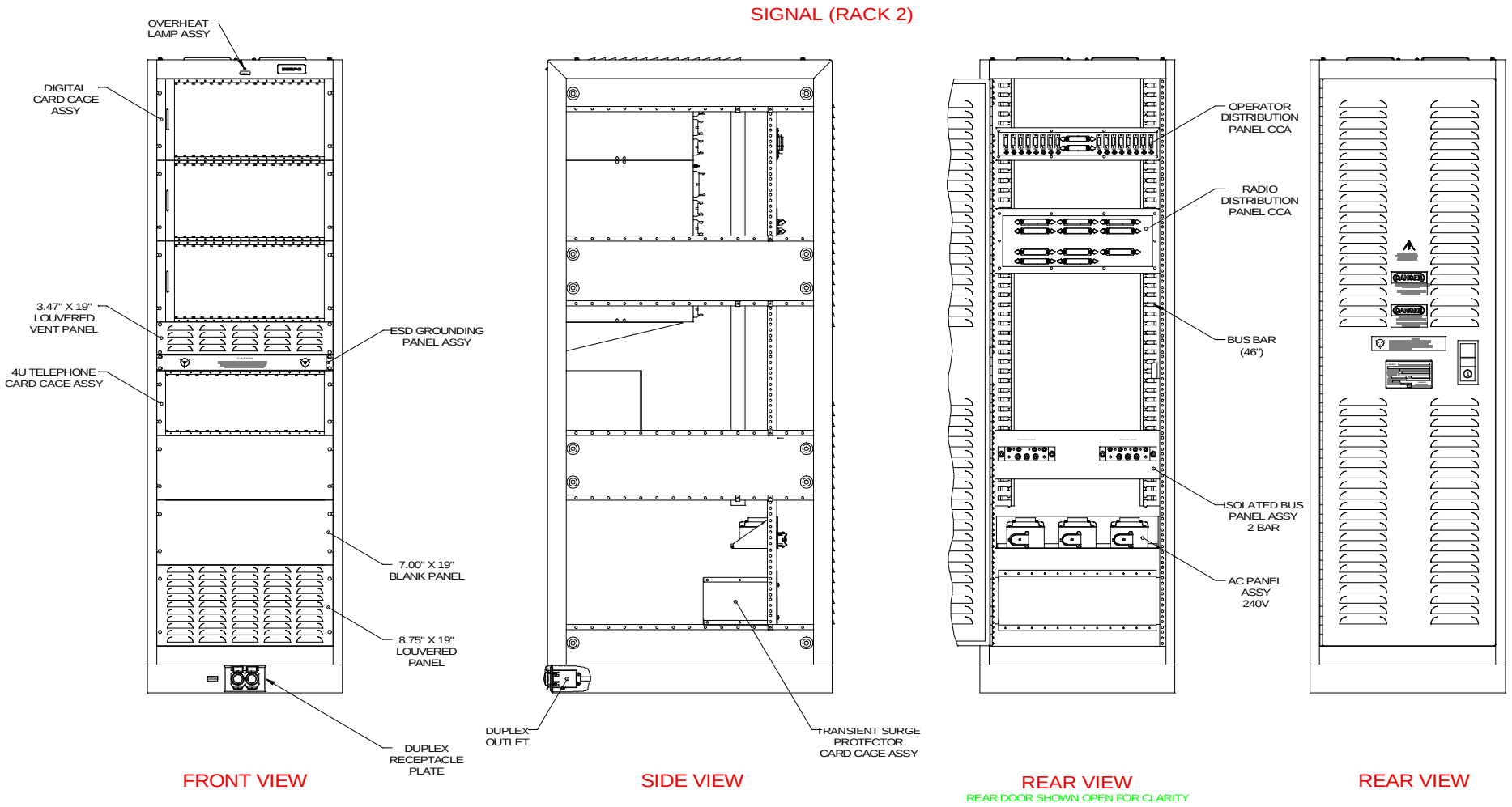


Figure A-17. Basic ETVS System 1 (BS-1); Racks 1 and 2; Front, Side, and Rear Views (Sheet 2 of 2)

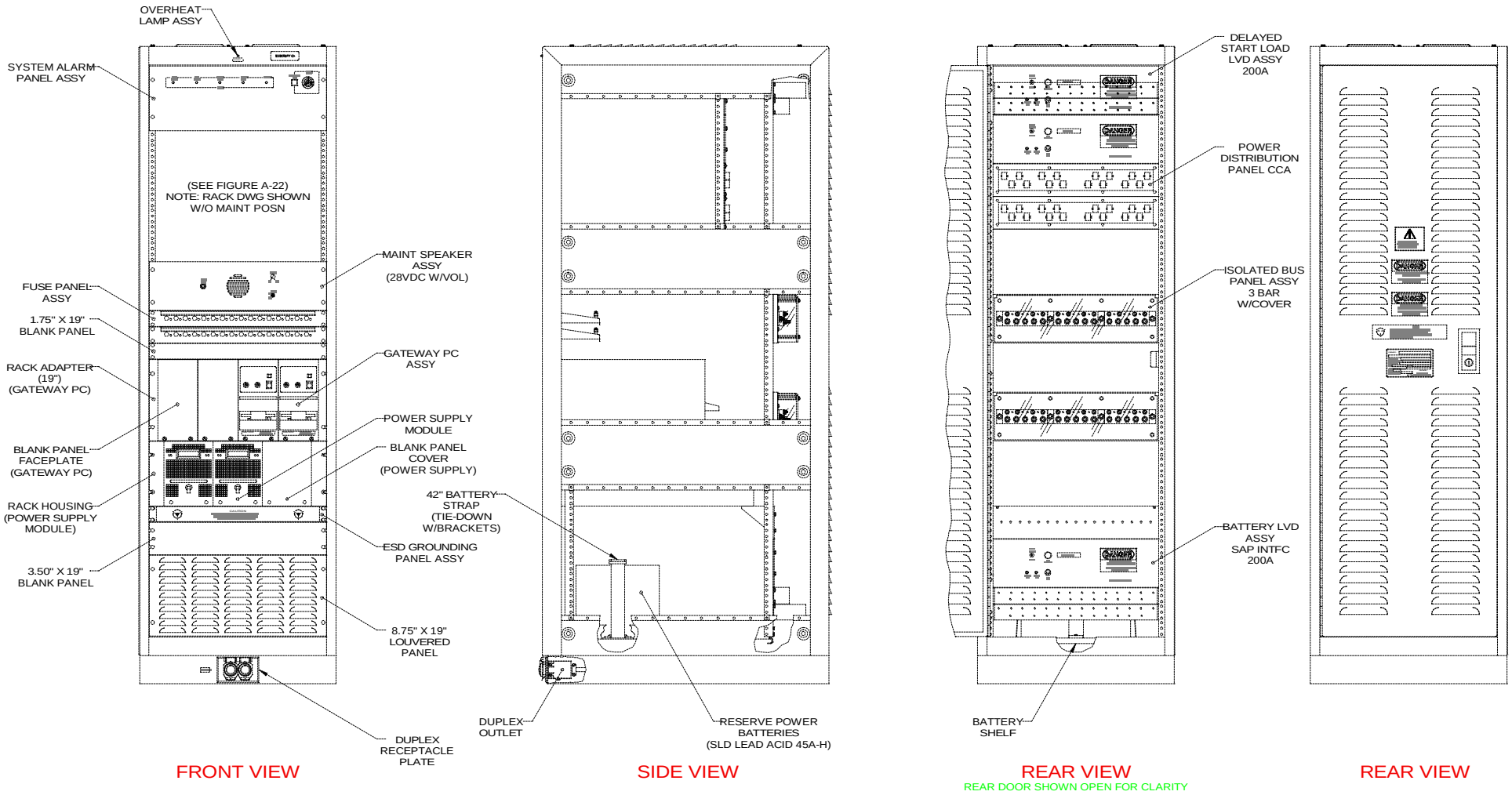


Figure A-18. Basic ETVS System 2 (BS-2); Racks 1-3; Front, Side, and Rear Views (Sheet 1 of 3)

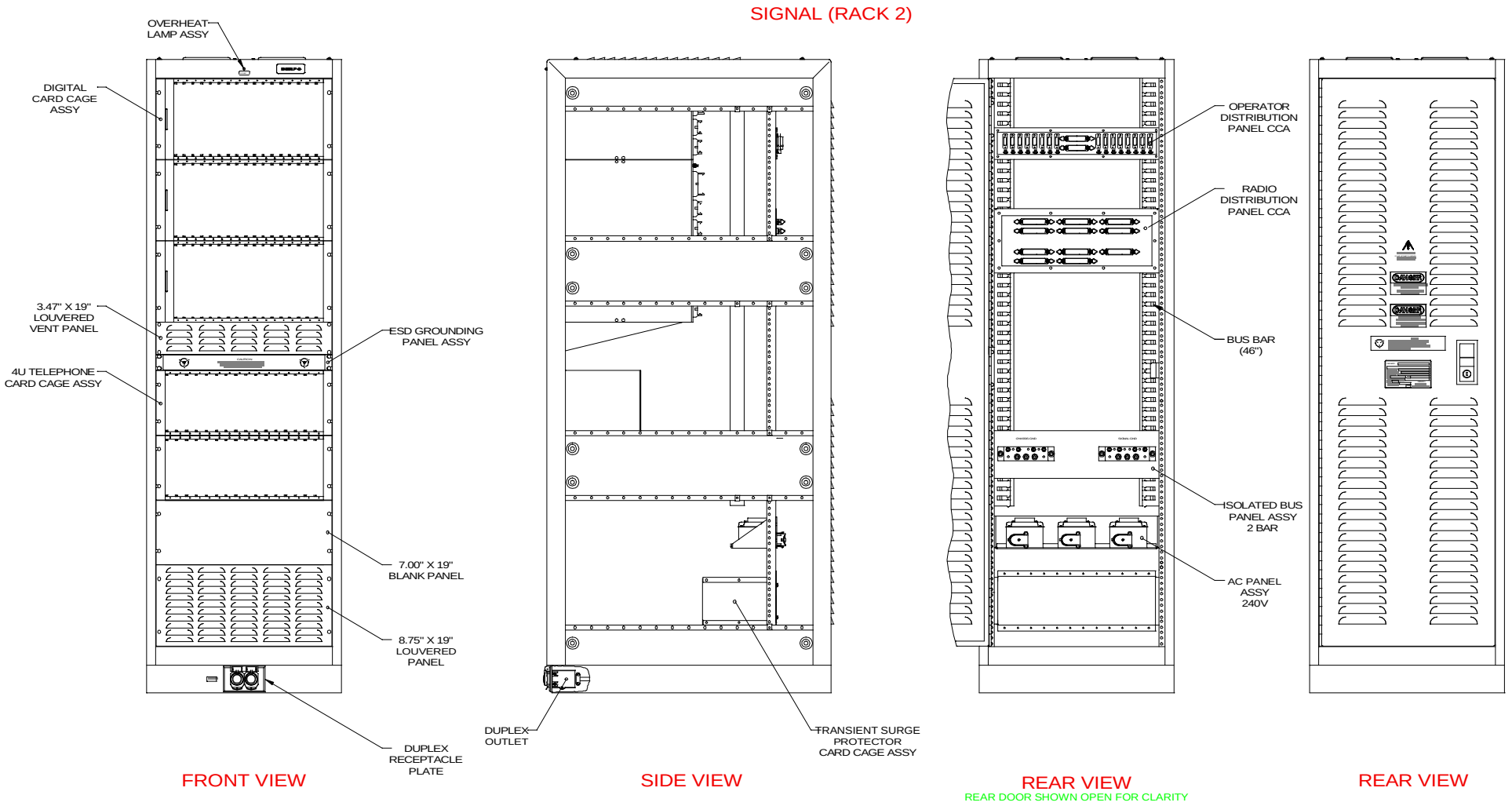


Figure A-18. Basic ETVS System 2 (BS-2); Racks 1-3; Front, Side, and Rear Views (Sheet 2 of 3)

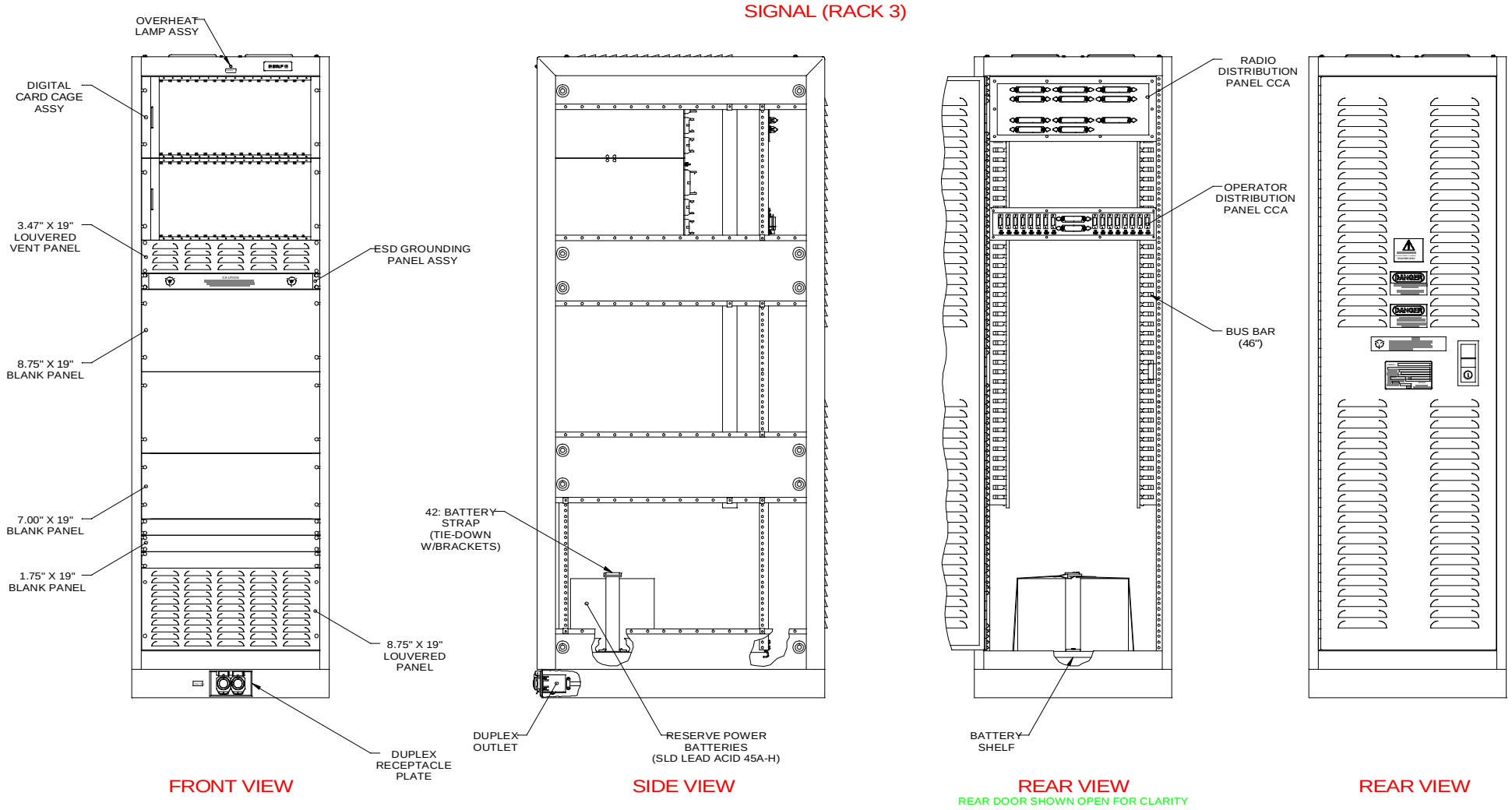


Figure A-18. Basic ETVS System 2 (BS-2); Racks 1-3; Front, Side, and Rear Views (Sheet 3 of 3)

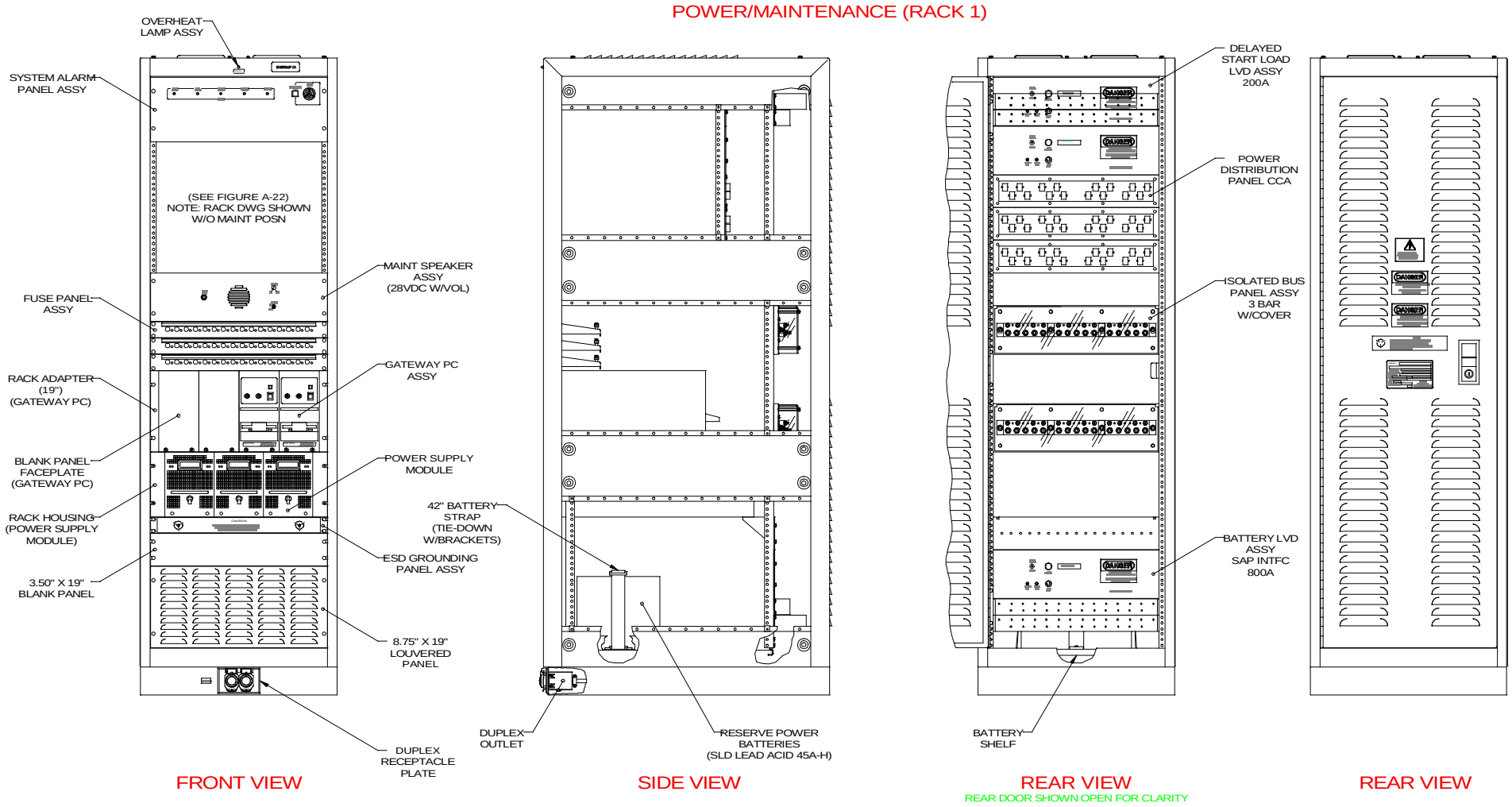


Figure A-19. Basic ETVS System 3 (BS-3); Racks 1-4; Front, Side, and Rear Views (Sheet 1 of 4)

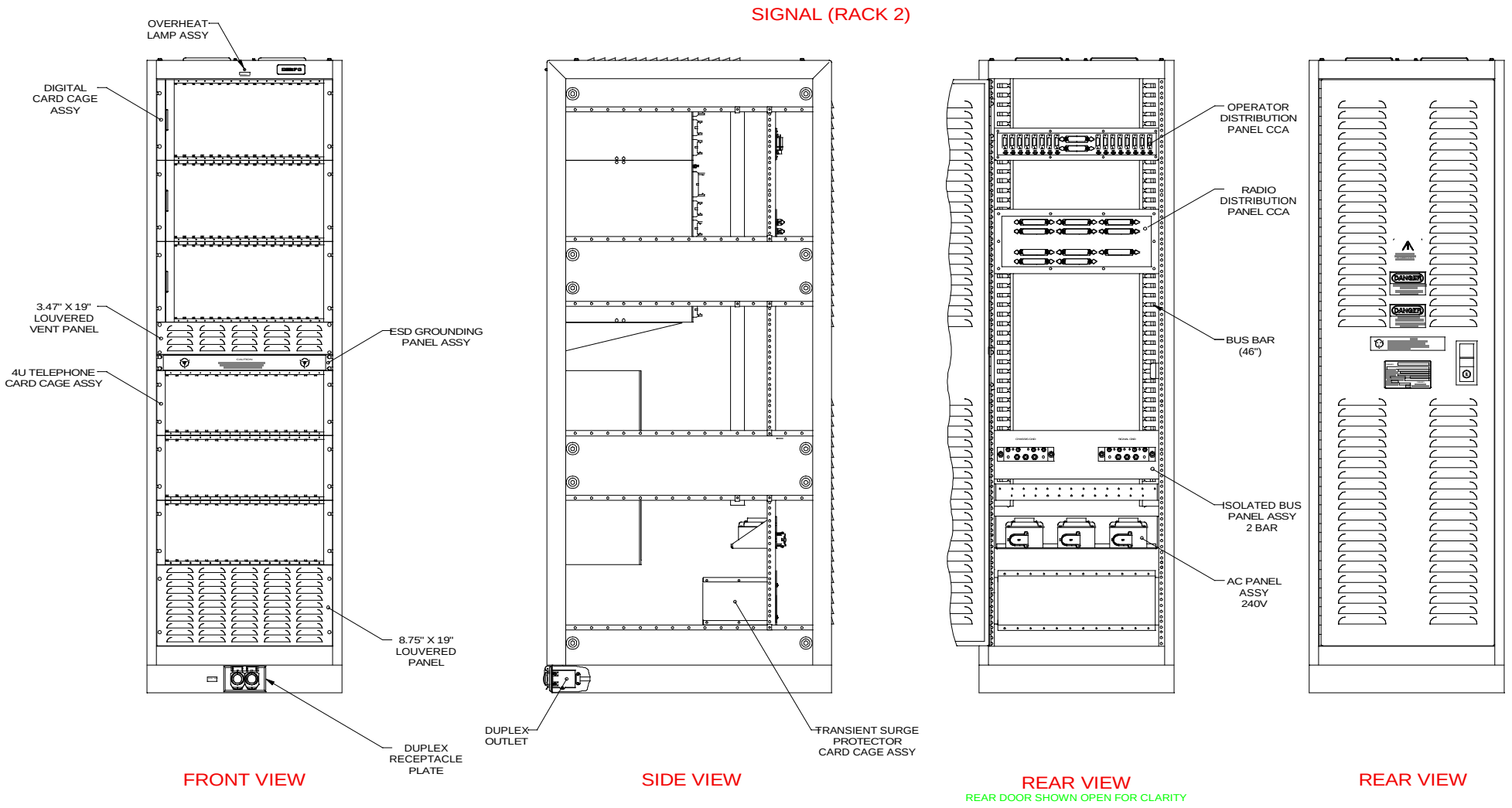


Figure A-19. Basic ETVS System 3 (BS-3); Racks 1-4; Front, Side, and Rear Views (Sheet 2 of 4)

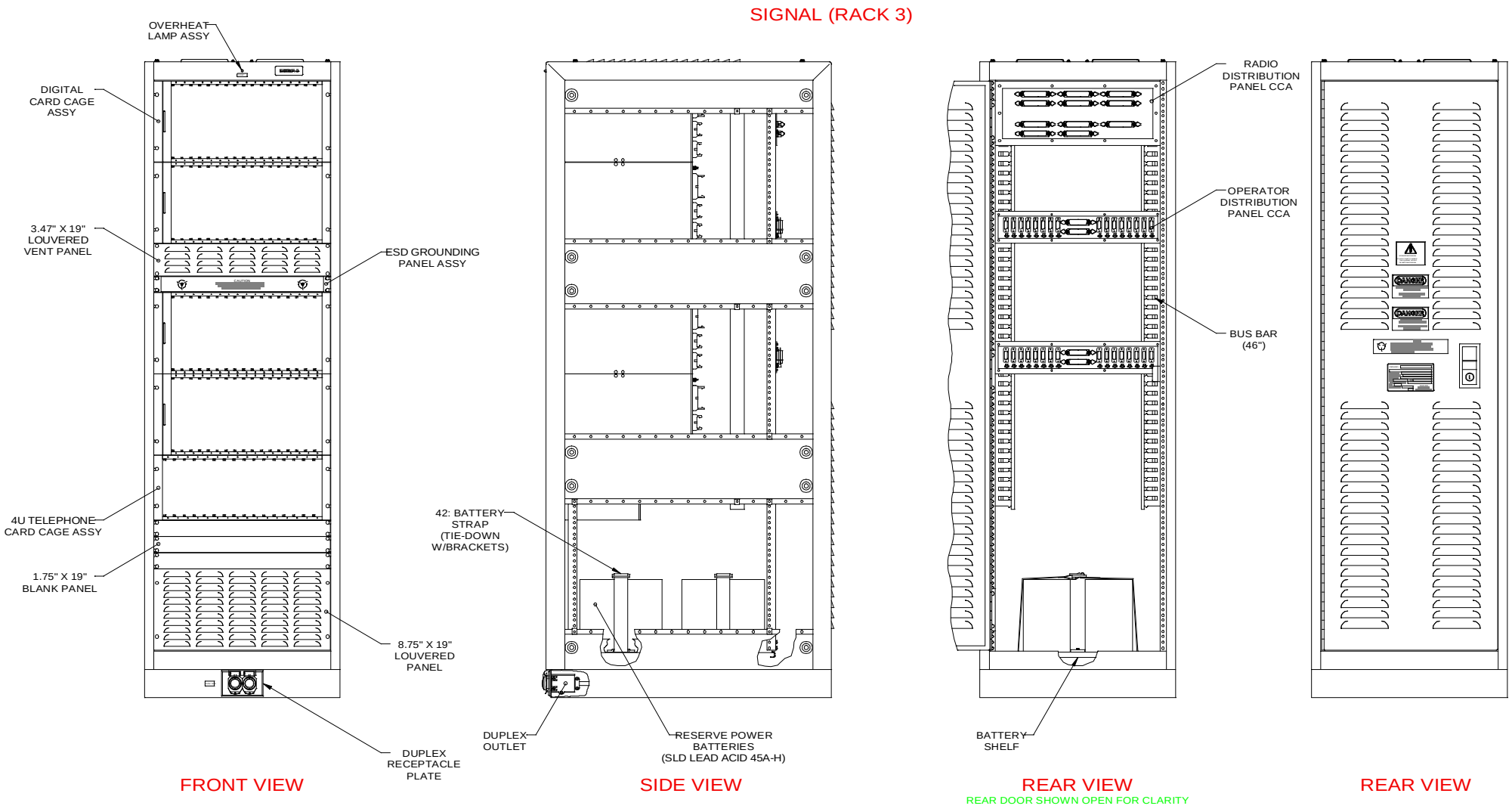


Figure A-19. Basic ETVS System 3 (BS-3); Racks 1-4; Front, Side, and Rear Views (Sheet 3 of 4)

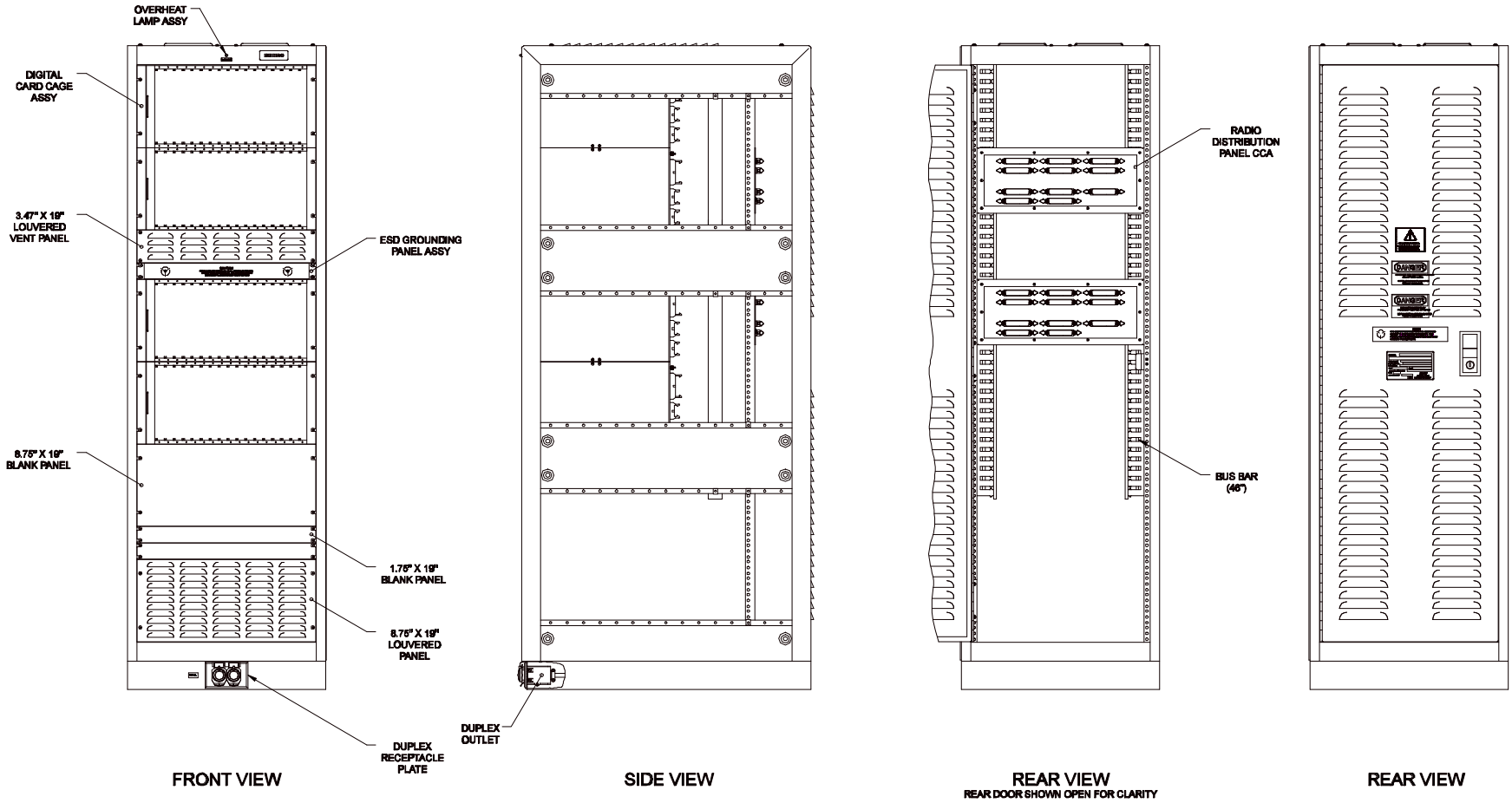


Figure A-19. Basic ETVS System 3 (BS-3); Racks 1-4; Front, Side, and Rear Views (Sheet 4 of 4)

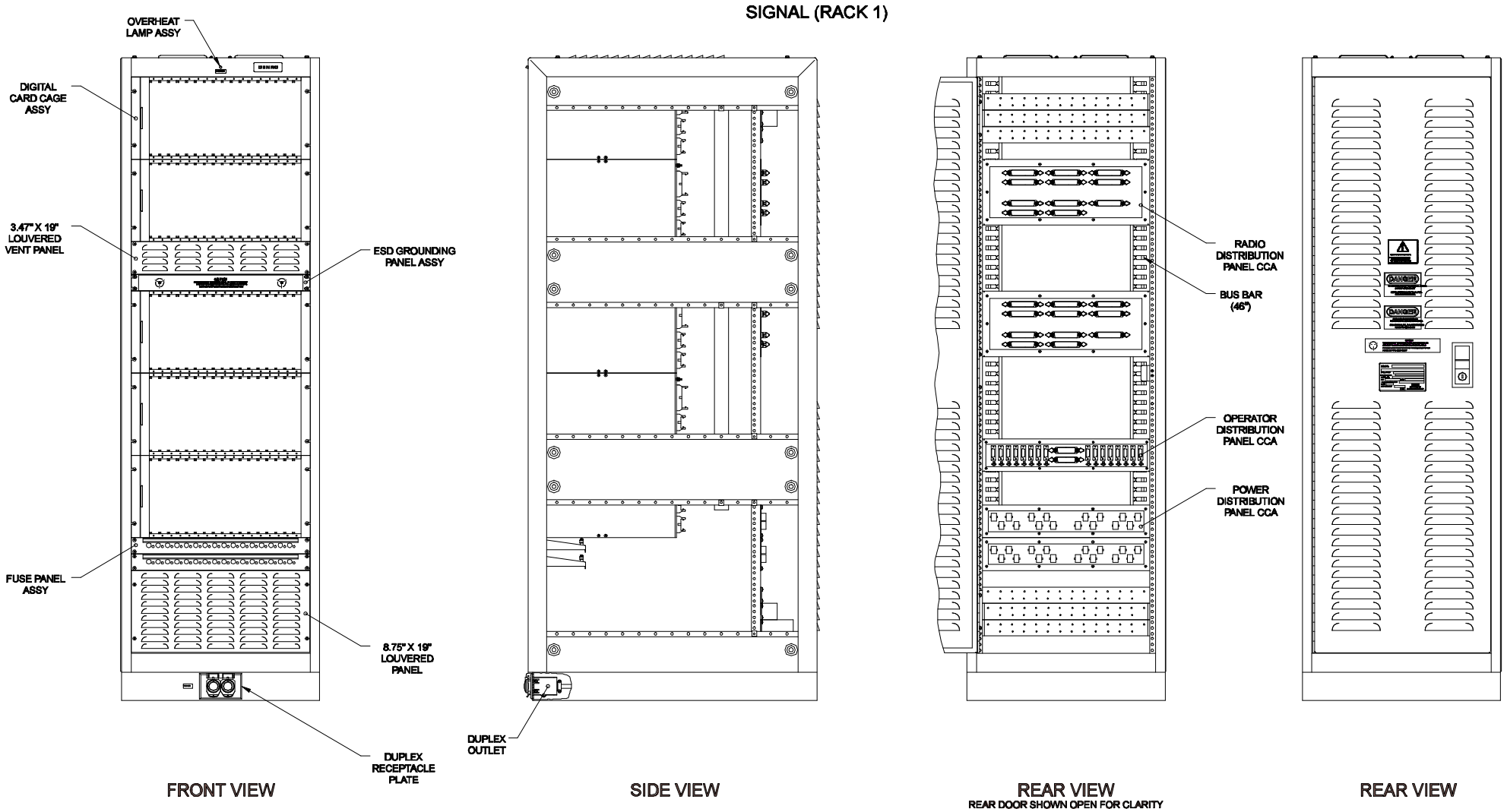


Figure A-20. Basic ETVS System 4 (BS-4); Racks 1-7; Front, Side, and Rear Views (Sheet 1 of 7)

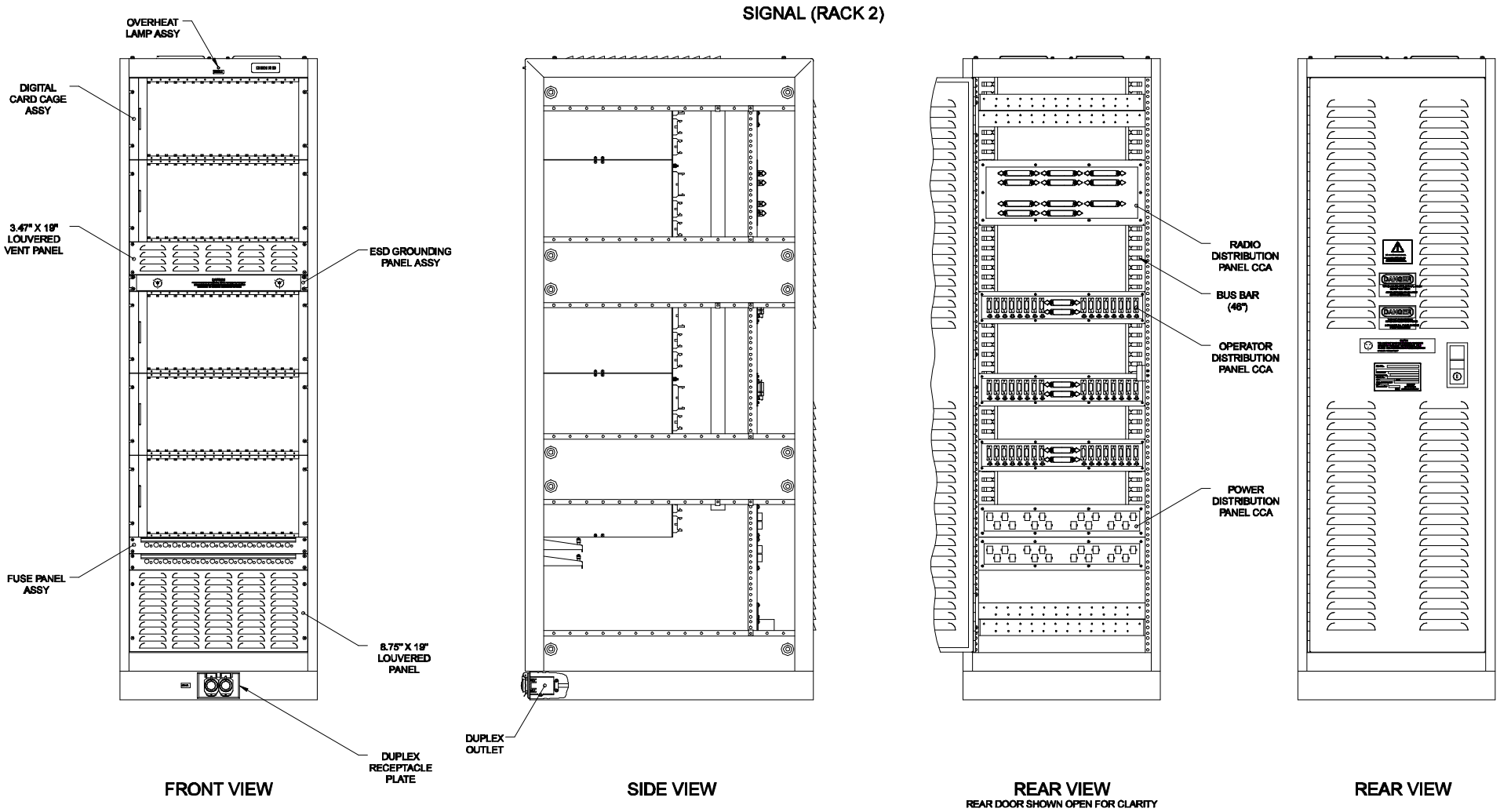


Figure A-20. Basic ETVS System 4 (BS-4); Racks 1-7; Front, Side, and Rear Views (Sheet 2 of 7)

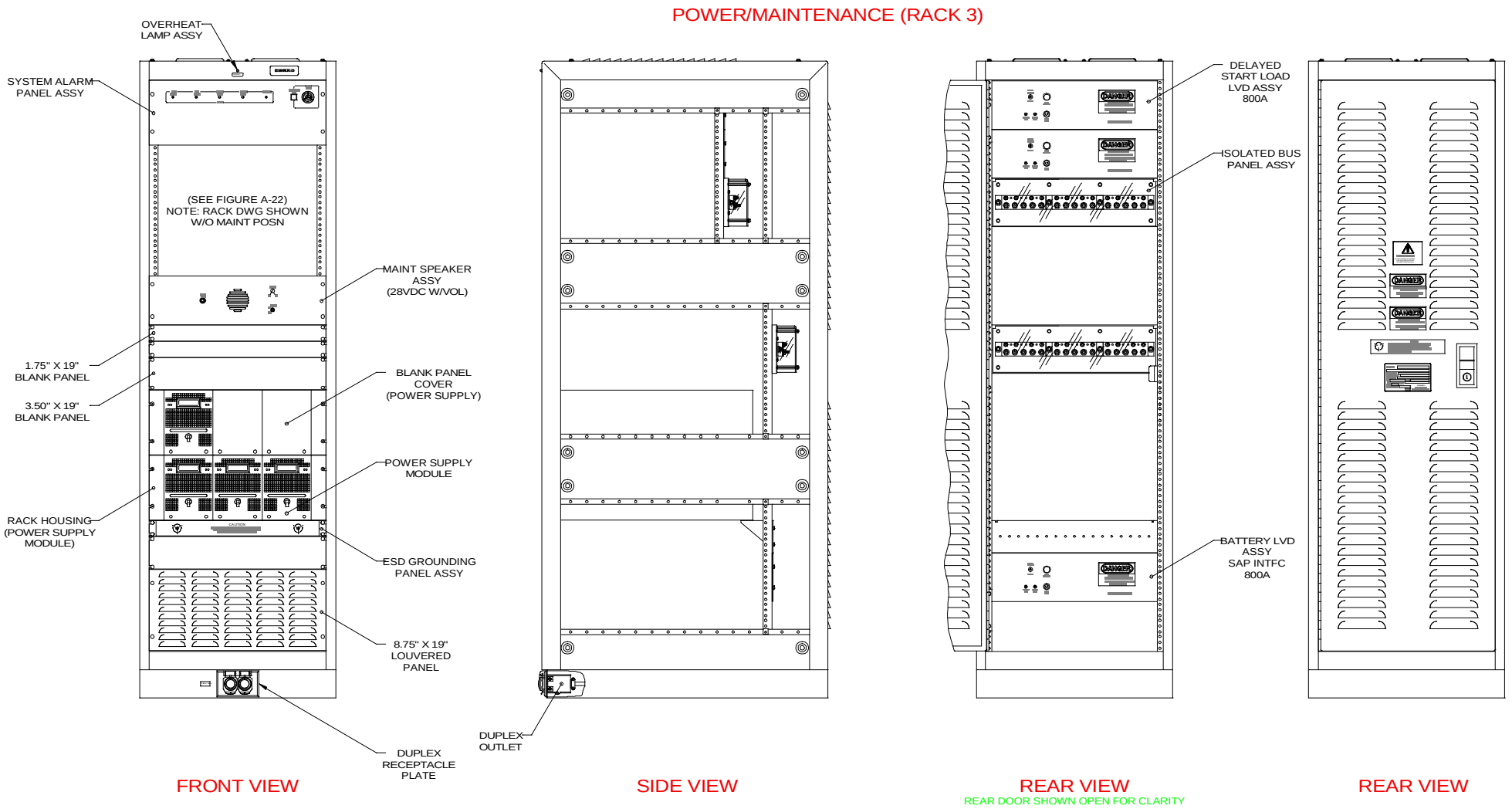


Figure A-20. Basic ETVS System 4 (BS-4); Racks 1-7; Front, Side, and Rear Views (Sheet 3 of 7)

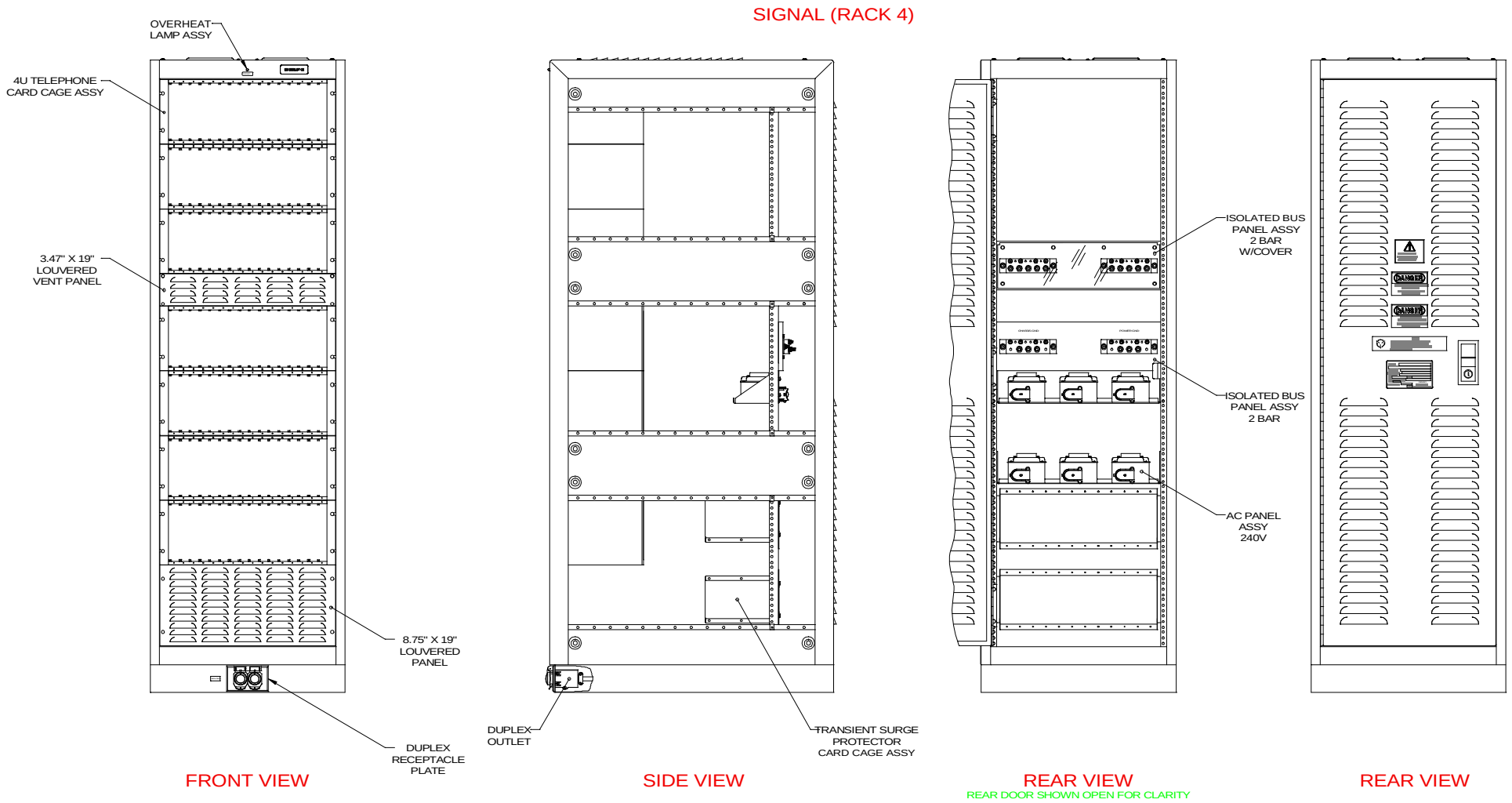


Figure A-20. Basic ETVS System 4 (BS-4); Racks 5-7; Front, Side, and Rear Views (Sheet 4 of 7)

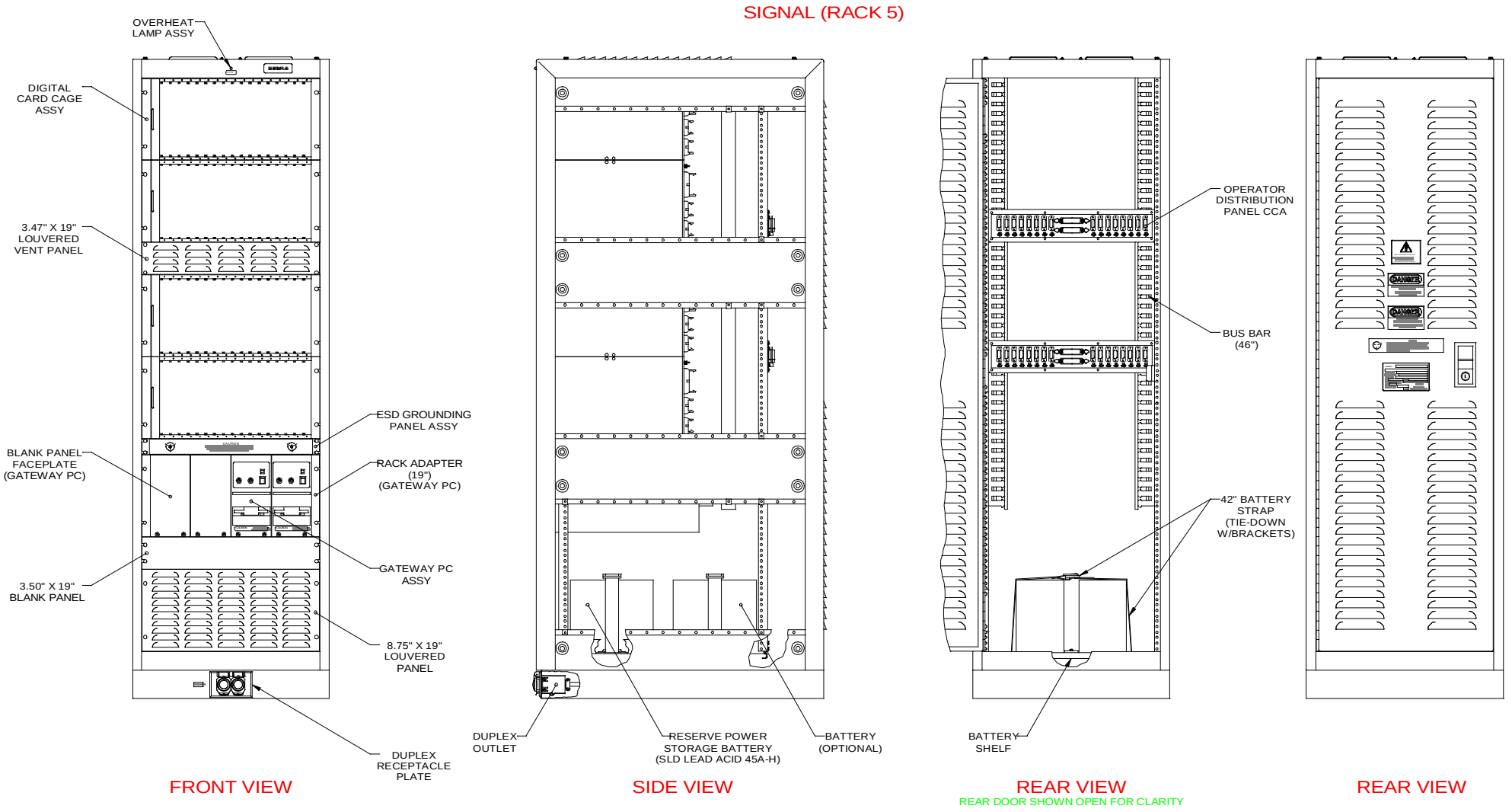


Figure A-20. Basic ETVS System 4 (BS-4); Racks 1-7; Front, Side, and Rear Views (Sheet 5 of 7)

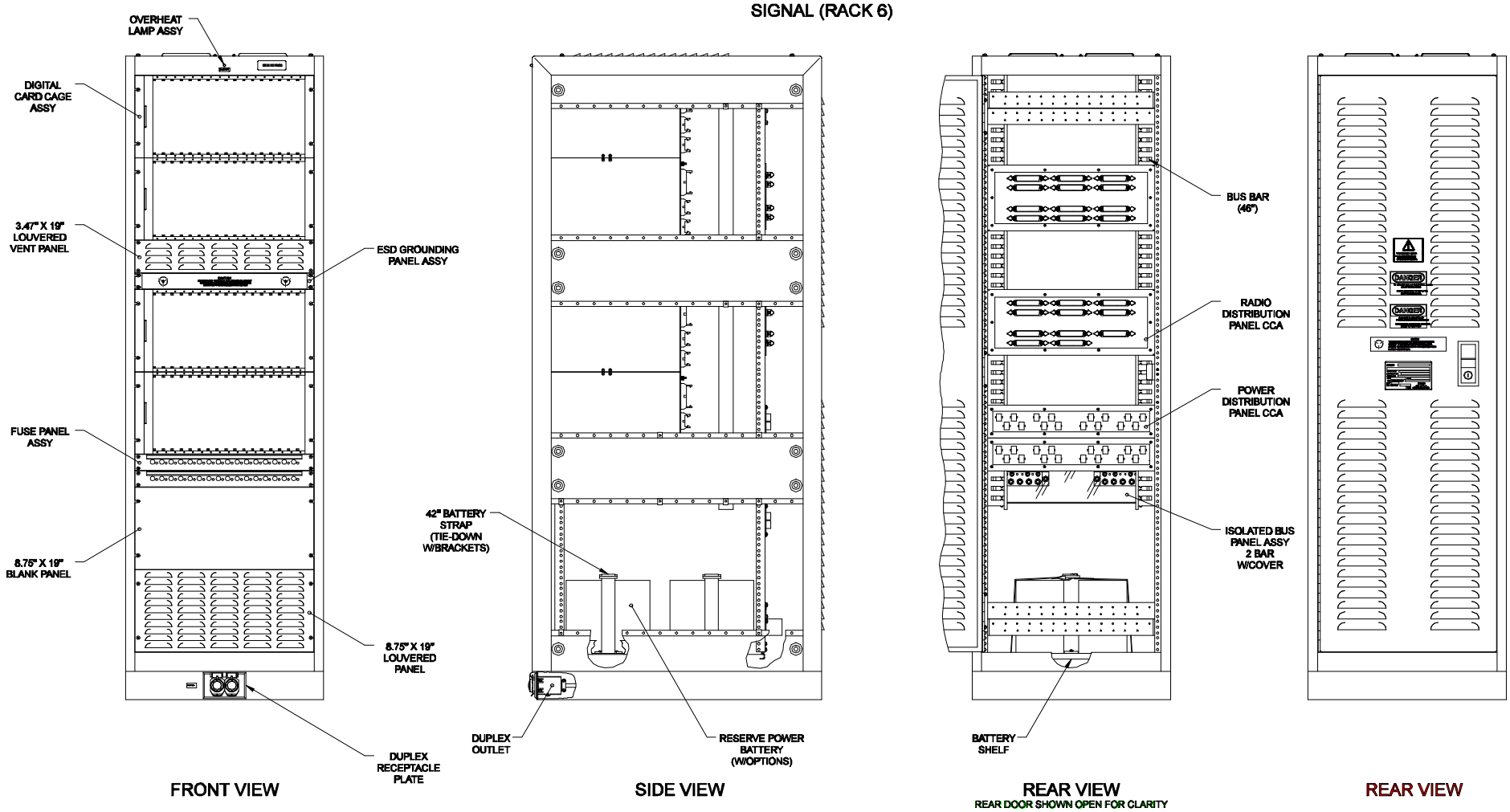


Figure A-20. Basic ETVS System 4 (BS-4); Racks 1-7; Front, Side, and Rear Views (Sheet 6 of 7)

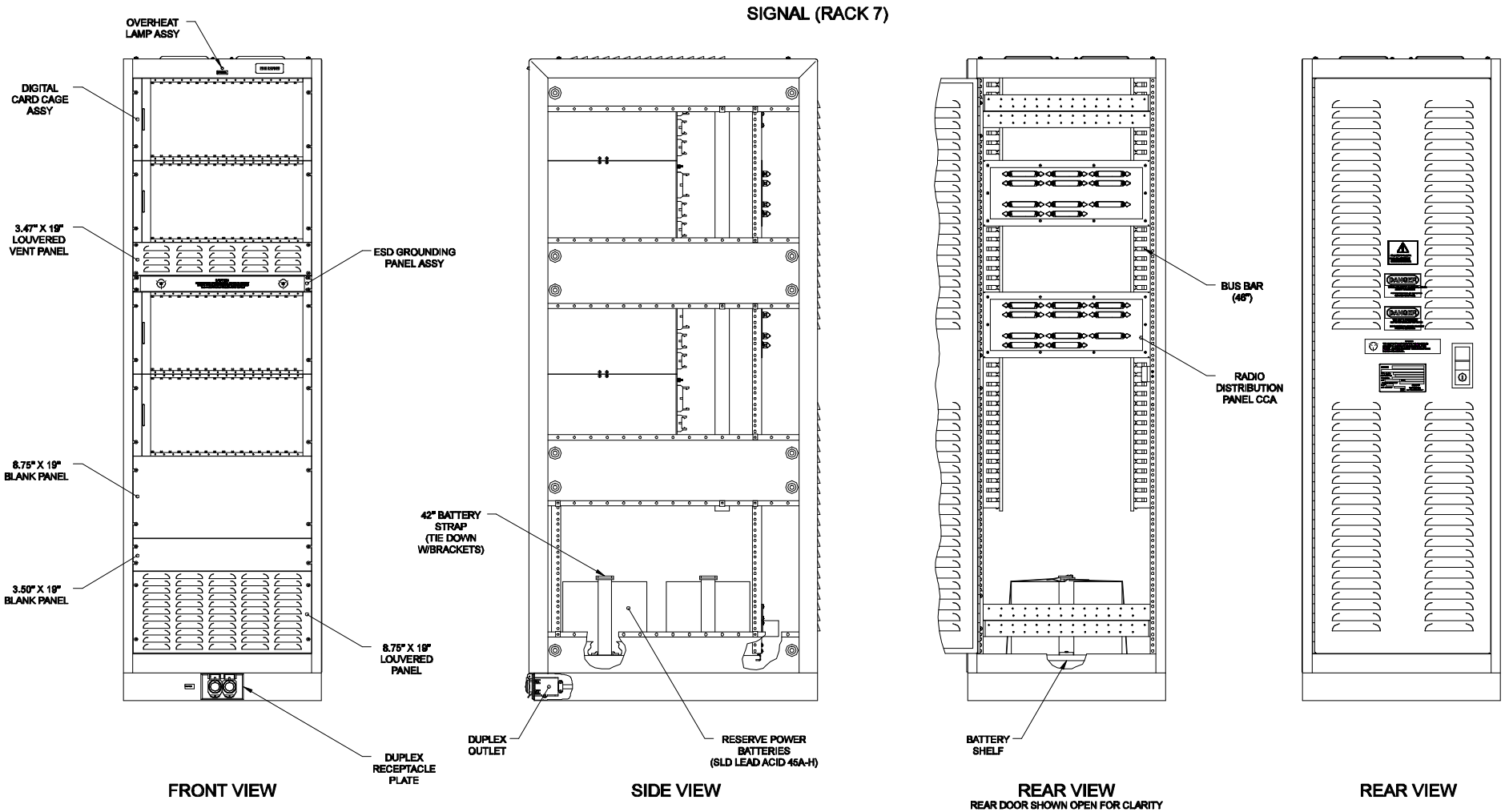


Figure A-20. Basic ETVS System 4 (BS-4); Racks 1-7; Front, Side, and Rear Views (Sheet 7 of 7)

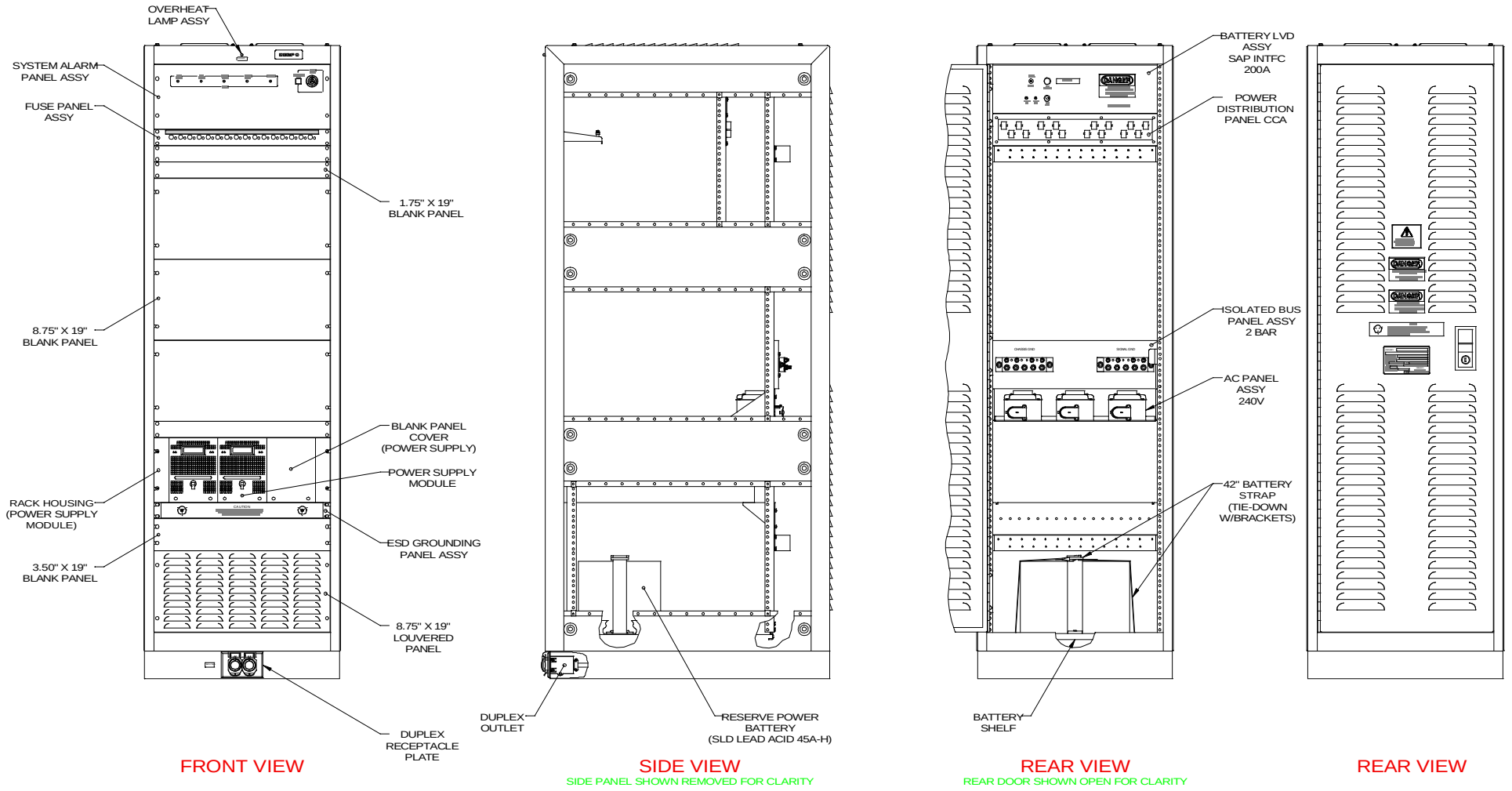
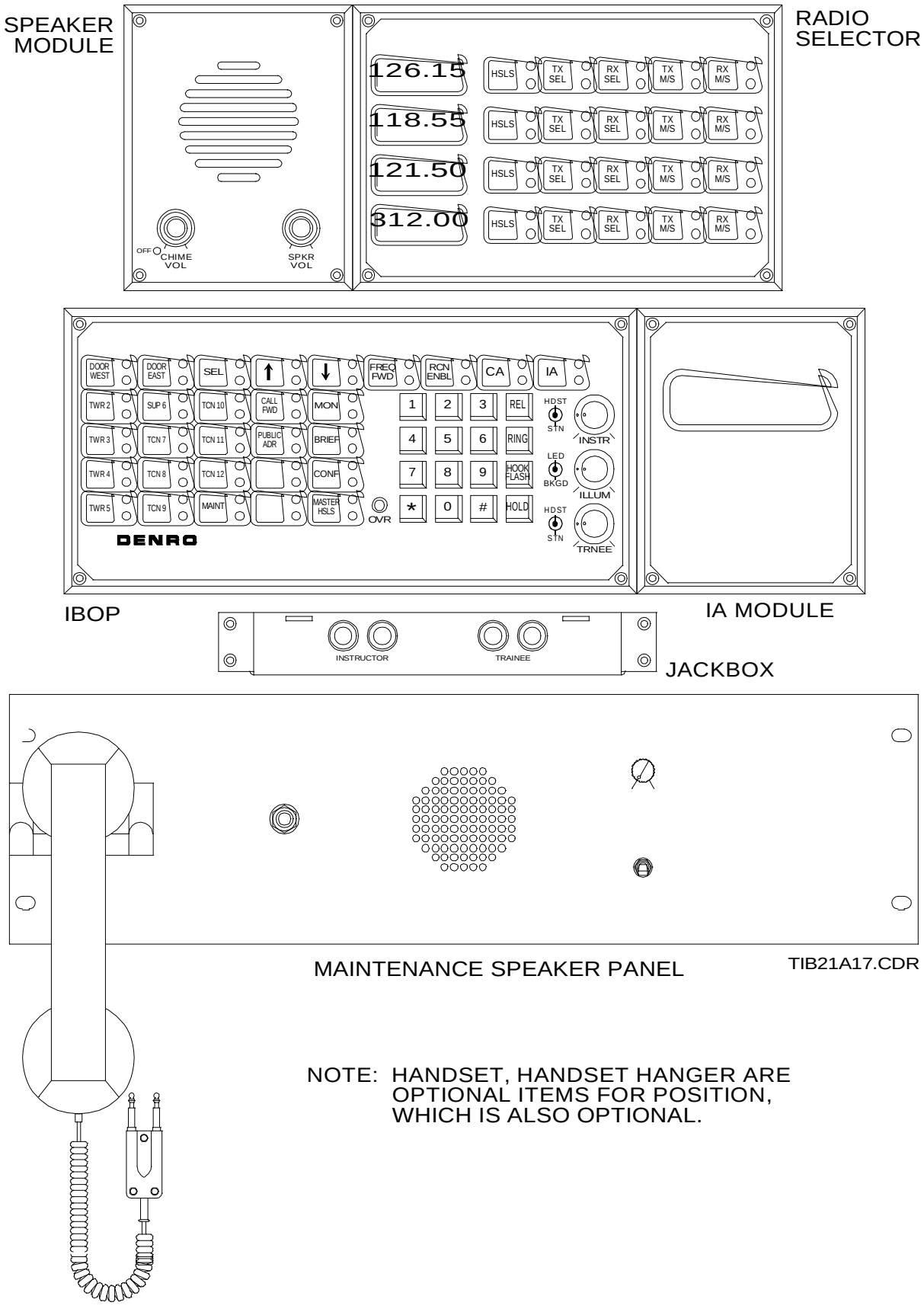


Figure A-21. Rack Assembly, ETVS, Remote Power, 4-Position



NOTE: HANDSET, HANDSET HANGER ARE OPTIONAL ITEMS FOR POSITION, WHICH IS ALSO OPTIONAL.

Figure A-22. Central Rack Maintenance Position Equipment (Hardkey) (Optional)

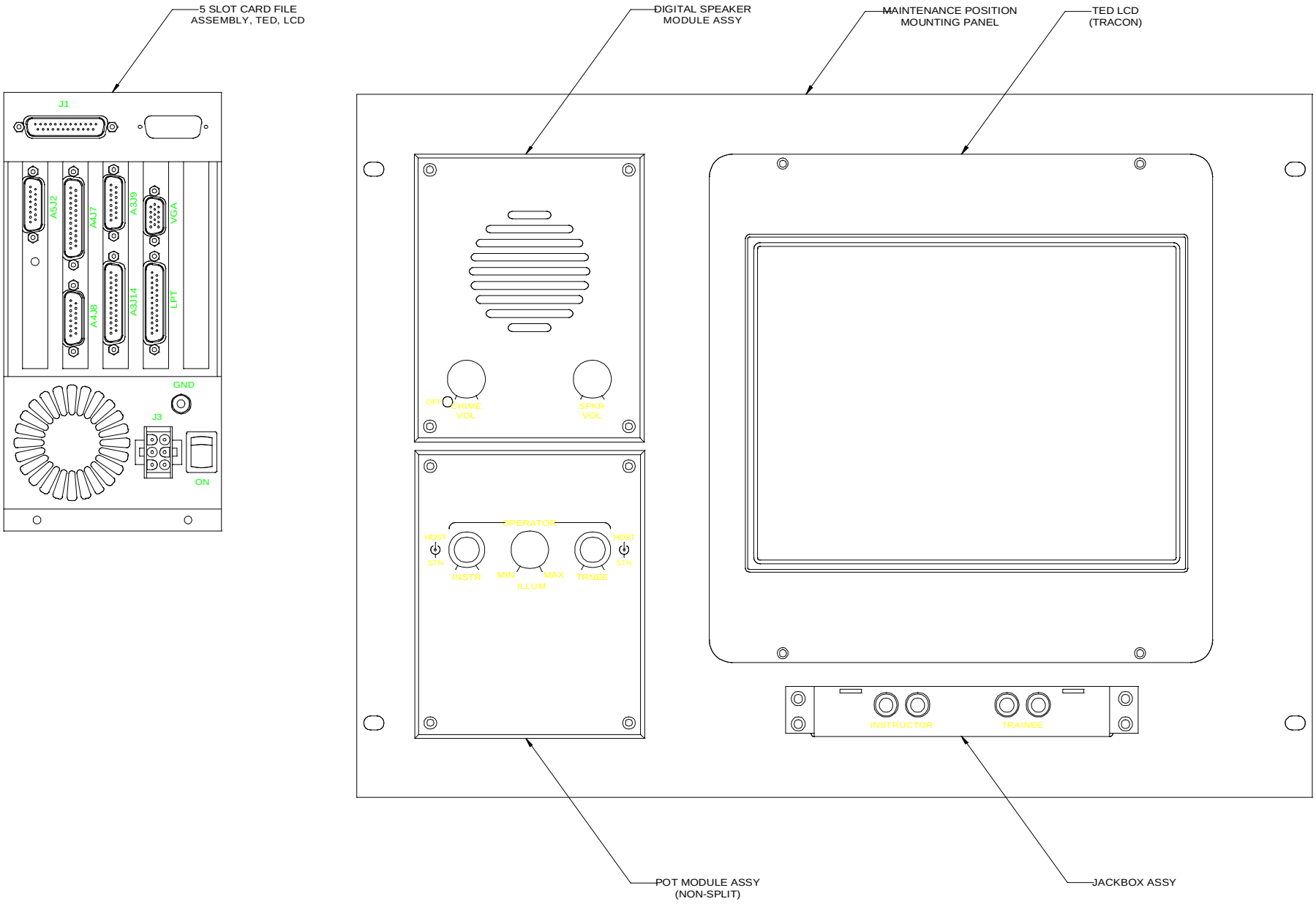
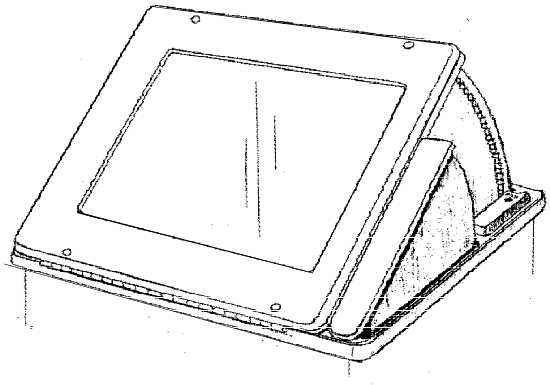
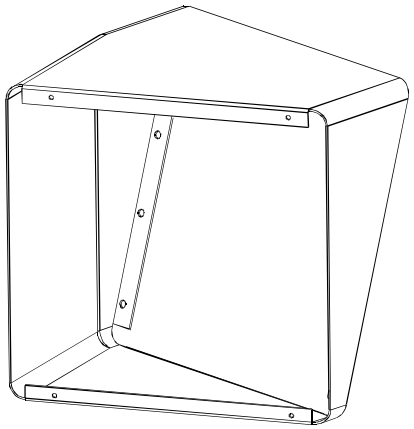


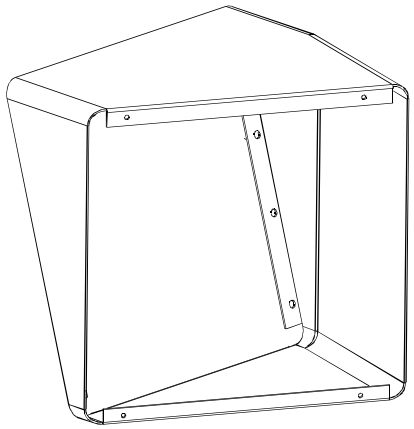
Figure A-22. Maintenance Position Assembly, TRACON TED



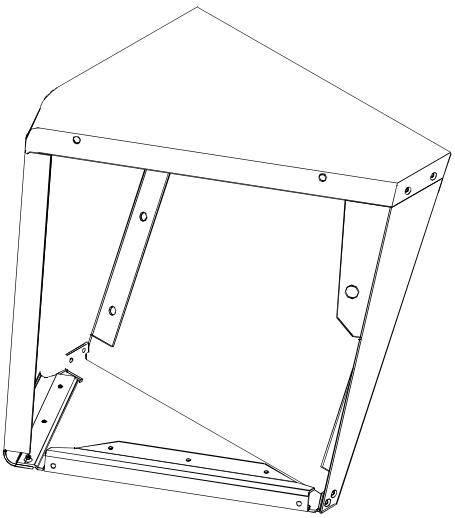
HINGED TOWER TED
P/N 110989-001



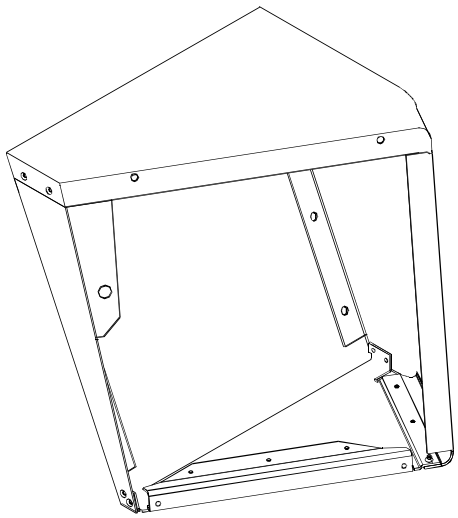
UPPER LEFT HAND TRACON WEDGE
P/N 144923-002



UPPER RIGHT HAND TRACON WEDGE
P/N 144923-001



LOWER LEFT HAND TRACON WEDGE
P/N 144924-002



LOWER RIGHT HAND TRACON WEDGE
P/N 144924-001

Figure A-23. TED Hinged and Wedge Configurations

APPENDIX B

GLOSSARY OF TERMS, ABBREVIATIONS, AND ACRONYMS

APPENDIX B

GLOSSARY OF TERMS, ABBREVIATIONS, AND ACRONYMS

B.1 INTRODUCTION

Appendix B provides definitions of technical/specialized terms, abbreviations, and acronyms used in ETVS documentation.

ACI
Auxiliary CEPT Input. A 32-channel, 2.048 Mbps serial ST data stream used to bus data into a device. Three ACI streams (labeled ACI1, ACI2, ACI3) are used to input data to the 0perator Processor board from the Maintenance Access Unit.

ACO
Auxiliary CEPT Output. A 32-channel, 2.048 Mbps serial ST data stream used to bus data from a device. Three ACO streams (labeled ACO1, ACO2, ACO3) are used to output data from the Operator Processor board to the Maintenance Access Unit.

A/D
Analog-to-Digital. Conversion of analog signals to digital equivalent.

A/G Air-to-Ground

Alarm
An alarm is a special message sent to the SCT from the ETVS. It notifies the SCT and MCT users of some significant event such as a board failure. Alarms are not always errors; they can also be informational. The SCT can be configured to beep when alarms are received.

AMPL Amplitude

ASU Automatic Signaling Unit (Phone Interface)

ATC Air Traffic Control

ATIS Automated Terminal Information Services

ATS Administrative Telephone System

AUD Audio

AUX Auxiliary

B & D Bearer + Data (ISDN Channels)

BG/Bg Beige

BITE Built-In Test Equipment

BKGD Background

BOP Basic Operator (Position) Panel

BRDG
Bridging. Connecting one electrical circuit in parallel with another (e.g., to monitor transmit/receive levels without disrupting or disabling circuitry operation).

BRF Brief (A/G) (Key type)

BS
Basic System (Configuration); ETVS has four different configurations, designated BS 1 through BS 4.

BW Bandwidth

CA Common Answer (Key type)

Card Cage
The card cage for 5U height cards consists of seventeen slots which hold processor and interface boards. The back of each card cage has a backplane with connectors to supply power and signals to each board. There is a rotary hex switch and a jumper on the backplane to set the card cage number. The card cages are connected to each other with cables to carry the control data bus and audio signals.

CCA Card Cage Assembly; Circuit Card Assembly

CCS Configuration Control Subsystem/Configuration and Control Subsystem

CCW Counterclockwise

CDB
Control Data Bus. A redundant parallel bus interfacing the Central Equipment Processor boards with the CCS and each other. Also called the A/B Data Bus, Redundant A/B Data Bus, and A/B Control Data Bus.

CDPRAM
Conference (Conference Map) Dual Port Random Access Memory. A dual port Random Access Memory on the Telephone Conferencer CCA, used to store the conference list data. It is loaded by the board CPU and read by the Digital Signal Processor (DSP).

CDT
Coded Data Transceiver. A networking transceiver that uses transparent Manchester encoding/decoding through transformer-coupled links. Associated with the High Speed Data Links.

CEPT Central European Post Telegraph—A serial 2.048-MHz, 32-channel data transmission protocol. Also referred to as E1.

CHI Computer Human Interfaces

Cluster
A group of thirty consecutive channels. The ETVS has sixteen clusters. In each group there are thirty audio channels and two channels for signaling framing.

CMOS Complimentary Metal-Oxide Semiconductor

CMU Cluster Multiplexer Unit

Codec
Co(der)/Dec(oder); specialized chips that do all of the coding and decoding within the system, as for example, conversion of analog signals to digital and vice versa.

Combined Mode
A split mode requiring use of only one operator. At TED-equipped positions in combined mode, the A/G jack side of the position operates identically to a single normal position at which the operator can control A/G, G/G, and IC from a single TED. In this "combined" mode, the G/G (left-jack) side of the position console is inactive. Also split positions can be switched to the combined mode so that all traffic is controlled from one of the TEDs or from a set of hardkey panels.

Configure
The boards within ETVS conform to various operations if the proper strapping or jumpers are set. The position DA and DTMF buttons can be set up at the SCT.

COTS Commercial Off-the-Shelf

CPS
Cross-Point Switch (Digital). Switching device used in ETVS for multiplexing or for signal switching between I/O ports. In either application, the CPS operates as a sophisticated switching matrix. Data enters the CPS in serial ST-Bus format; however, all data movement within the switch matrix is in 8-bit parallel format.

CPU Central Processor Unit

CSC Computer Software Configuration

CSCI Computer Software Configuration Item

CSMA/CD Carrier Sense Multiple Access with Collision Detection (see CDB, Control Data Bus)

DA Direct Access (Key type)

D/A
Digital-to-Analog. Conversion of digital signals to analog equivalent.

Data Frame
A group of data channels on a TDM bus. Each channel holds the data sample for a common sample period.

Demarc
Demarcation. Connection point between outside world (radio and telephone) and the ETVS distribution panels in the back of the Central Equipment Racks.

DIAG/DIGN Diagnostic (Front panel switch/indicator)

Dial Pulse
An interruption of the direct current in a telephone system when the contacts in the calling telephone are opened. The number of interruptions represents the number dialed.

DPI
Dots per Inch. Used to define the print quality of the printer output for a dot matrix printer.

Down-Link
An 8-bit, parallel, 4.096-MHz, 512-channel TDM bus used to apply the system audio channels to the cluster audio boards. Also called the Voice Data Bus.

DSN Defense Switched Network

DSP Digital Signal Processor

DTMF Dual Tone Multi-Frequency

EEPROM
Electrically Erasable Programmable Read Only Memory (Firmware). Used for non-volatile storage of configuration data on board.

EIA Electronics Industries Association

EIS External Interface System

EL (Display) Electroluminescent

E&M (Signaling) Ear and Mouth

EMI Electromagnetic Interference

EPROM
Erasable PROM. Used for storage of firmware.

ESD Electrostatic Discharge

Ethernet Card
Network (Ethernet) Adapter (interface card). Used in LAN. Installed in empty card slots in gateway PC assemblies in central rack and in Local/Remote SCT/MCT kits. This card is 10 Base/adapter for 10 Mbps CSMA/CO LAN.

ETVS Enhanced Terminal Voice Switch

FB Fast-Blow (type of fuse)

FIFO
First In/First Out. Interface board; used to buffer the communications between the gateway computer and the Gateway Interface. Installed in an empty card slot in the gateway computer. The FIFO interface card exchanges data between the computer and the interface at its own transmission speed, allowing data to pass between the gateway FIFO card and the gateway Computer data bus, although they operate at different data transmission rates.

F/P Front Panel

Frame Pulse/FRS
A clock used to establish the boundaries of a data frame. FRS is system frame pulse.

FRS System Frame Pulse

FSK Frequency Shift Keying

FTS Federal Telecommunications System

G/A Ground-to-Air

G/G Ground-to-Ground

Gateway
The gateway is a PC. It is used to interface the CCS and the central equipment in the ETVS; it is also used as a file server. The gateway interface board is an interface between the Gateway PC and the central rack control data bus.

GFE Government-Furnished Equipment

GND Ground (chassis, power, analog, digital, etc.)

Ground Start
Telephone signaling method using detection of a ground for line activation.

HDST Headset

HSDL
High-Speed Data Link. Used as a repeater for the redundant control data bus (or A/B control data bus). Can enhance system performance in several ways (e.g., reduce bus loading by multiple processors caused by multiple processors sharing the same redundant A/B control bus, etc.).

HSLS Headset - Handset/Loudspeaker

IA Indirect Access

IBOP Integrated Basic Operator Panel

IC Intercom; Integrated Circuit

I^2C
Inter-Integrated Communications. A small area network or communication protocol. It is a standard serial bus interface used in the communications industry. The ETVS uses

this bus as a small area network interconnector for position equipment pushbutton modules and volume controls.

ID Identification

IDF
Intermediate Distribution Frame (ETVS). Facilitates the interconnection of all cables to the government EDFs (e.g., demarc).

IF Intermediate Frequency

IMDPRAM
Index Memory (Map) Dual Port RAM. A dual port Random Access Memory on the Telephone Conferencer CCA, used to store the VDPRAM address for the digital voice channel data on the Voice Data Bus. It is loaded by the board CPU and read by the Time Slot Latch circuitry.

IMTA Impedance Matching Test Adapter (DENRO P/N 110311-001)

INSTR Instructor

Interface
An interface is a board which communicates with equipment outside the ETVS. Interfaces can either be intelligent (processor on board), or dumb (no processor). In many cases, a dumb interface board is associated with a parent processor device.

Interlocked
Remote radio processor that obtains access to the radio equipment via a 4-wire trunk to a communications switch with a radio processor connected directly to the radio equipment. The interlocked system uses the interlocking system for access to the radio equipment.

Interlocking
Remote radio processor connected directly to the radio equipment. The interlocking system is the system providing access to the radio equipment.

I/O Input/Output

IP Interphone

ISA
Industry Standard Architecture. Name given to the bus architecture developed by IBM for the PC AT version of its personal computer.

ISDN
Integrated Services Digital Network. A communications network intended to carry digitized voice data multiplexed into a public telephone network. As applied to the ETVS, provides special connections that use ordinary telephone lines to transmit digital instead of analog signals, allowing faster transmission via modem. Interconnects the position and central rack equipment.

Key
A pushbutton at a position. Keys are programmable at the SCT. ETVS utilizes both locking keys and non-locking keys.

A locking key switch functions as a toggle switch. It is pressed once to initiate an action and then a second time to terminate action. Most keys are locking keys.

Non-locking keys function as momentary switches; they are depressed and held down to initiate and continue action and then released when action is to be terminated.

LAN Local Area Network

LCD Liquid Crystal Display

LED Light Emitting Diode

LINCS Leased Interfacility NAS Communications System

Lockout
Signal that prevents other operators from keying a transmitter at the same time unless that operator has preempting privilege (priority). Prevents more than one operator from keying the same transmitter.

Loop Start
Telephone signaling method using detection of a loop closure for line activation.

LRU
Line Replaceable Unit. Level of Maintenance that has been designated for on-site ETVS system corrective maintenance. LRUs are identified in the Level of Repair Analysis (LORA) report. The LRU is the lowest level of indenture component that may be physically removed and replaced by the on-site technician without use of Depot resources. No repairs are to be done on LRUs except at Depot. A diagnostic display terminal will identify the defective component to the LRU level.

LS Loudspeaker

LVD Low Voltage Disconnect

Maintenance Busy
Maintenance busy is a device option (set up by the supervisor at the SCT) allowing a device to be reconfigured at the MCT. A device placed in Maintenance Busy mode can be tested and/or reconfigured by maintenance personnel without affecting the other on-line devices. If the SCT sends a global map, only the on-line devices will receive the map. In addition to reconfiguration capabilities, Maintenance Busy allows maintenance personnel to perform monitoring and loopback testing from a maintenance position to an operator position as configured in the MCT.

Main/Standby
Main/standby refers to a pair of boards which adds redundancy to the system and provides fault tolerance for critical system functions. Only one board is active in the system at a time. In case of failure of the main board, the standby takes over. Main/standby boards which produce audio share the same audio channels.

MBOP Mini Basic Operator Panel

MCT Maintenance Configuration Terminal

MDL Module

MIC Microphone

Modem Mo(dulator)/Dem(odulator)

Module
A group of position keys. There are two kinds of modules: a DA29 module which has twenty-nine DA keys and a DTMF keypad, and a DA 16 module which has sixteen DA keys arranged in a 4x4 matrix.

MON Monitor

MPS Maintenance Processor Subsystem

M/S Main/Standby

MUX/Muxing Multiplexer/Multiplexing

NC Normally Closed

N/C No connection (not used)

NDI Non Developmental Item

NISR
The Network Interface Status Reporter is a standalone Windows program that runs on Windows for WorkGroups 3.11 and has a 32-bit port that runs on Windows NT. It monitors the status of the Ethernet interfaces (cards and network connectivity) and the gateway connectivity through the network interfaces installed on a computer acting as SCT or Remote Server in the ETVS system.

NMI Non-Maskable Interrupt

NO Normally Open

NPN
Negative-Positive-Negative. A two-junction bipolar transistor with an N-type silicon collector and emitter and a P-type base used to control the record control loop.

Off-line
As this term applies to the SCT, it is off-line when not communicating with the gateway interface (and the rest of the system). The SCT can still be used for setting up a configuration while off-line, e.g., generating and storing maps.

As applied to the ETVS as a system, this term means that portion of the system that is not active or that is out of service.

On-line
As applied to the SCT, the SCT is on-line when it is communicating with the gateway interface. When on-line, the SCT can monitor and configure the rest of the system.

As applied to the ETVS as a system, the position or channels of the system that are active and operating normally.

OP Operator

OVR Override

PAC
Parallel Access Circuit. An Integrated Circuit (MT 9085) used to convert the data in 16 serial ST streams to an 8-bit parallel TDM format. Used in the ETVS TMUs/CMUs to generate the Voice Data Bus.

PAM Pulse Amplitude Modulation

Parallel bus
The parallel bus carries control messages between the various boards in the ETVS. Data links are used to bridge the parallel buses between systems. See CDB (Control Data Bus).

PBX Public Branch Exchange

PCA Position Card Assembly

PCB Printed Circuit Board

PCM Pulse Code Modulation

Position
A position is the name for the voice communication equipment used by the operator. It has a microphone, speaker, and keys to select various functions.

Position (Types)

- ***Combined.*** See 'Combined Mode.'
- ***Local and Remote Positions.*** Standard, supervisory, and maintenance positions of types 1 and 2 can be installed local or remote to the central rack. Local positions are connected to the central rack via a cable of not more than 500 feet and use the rack power supplies. Remote positions can be located up to 15,000 feet via cable from the central rack. Auxiliary power supplies, located at the remote positions, provide the necessary power. Remote Position Interface Units (RPIUs), installed at each end of an ISDN U cable, permit a cable length of 15,000 feet between the RPIUs. Remote positions that have configuration terminals use a modem link to connect the terminal with a file server that provides access to the LAN.
- ***Maintenance Position.*** The Maintenance Position is similar to supervisory positions but does not have recorder interfaces. The rack-mounted maintenance position primarily uses TED equipment (with TED LCD [TRACON], Digital Speaker, POT module, and jackbox); some systems may have hardkey equipment at this position.
- ***Type 1 Positions.*** Back-lighted pushbutton (hardkey) panels for high activity areas with normal-to-high ambient light levels.

  Type 1 positions take two forms: one with an Integrated Basic Operator Panel (IBOP) and the other with a card file and a mini-BOP (MBOP). At locations with limited console space, the mini-BOP configuration allows for a more compact panel arrangement because the card file contains the position signal processing circuitry normally integrated into the IBOP.
- ***Type 2 Positions.*** Color liquid crystal displays with digital matrix touch entry devices (TEDs) for low ambient light levels, or color LCD TEDs for high ambient light levels. Type 2 positions have card files that contain the signal processing circuitry.
- ***Normal and Split Positions.*** Normal and split configurations are available for type 1 and type 2 positions as follows:
  - *Normal Positions* control both air-to-ground (A/G) and ground-to-ground (G/G) communications from a single TED or set of hardkey panels. One operator controls a normal position.

- *Split Positions* possess two TEDs or a split hardkey panel: one TED controls A/G traffic and the other G/G traffic. Split positions can also be switched to combined mode so that all traffic is controlled from one of the TEDs or from the set of hardkey panels. Two operators control a split position in split mode. One handles A/G communications and the other G/G communications. In non-split mode, one operator controls the position.

- ***Supervisor Positions.*** Supervisor positions can be of the TED or hardkey types. They use the same equipment modules as standard positions but have, in addition, two tape recorders, a supervisory tape recorder interface, and an SCT.

- ***Supervisory Record.*** The supervisor position has facilities for monitoring selected positions and recording the monitored activity. This position is part of the position monitoring subsystem equipment configuration of the ETVS.

POT Potentiometer

PRE CON Preset Conferencer

PROM Programmable Read Only Memory

PS Power Supply

PSTN Public Switched Telephone Network

PTT Push to Talk

Racks (Electrical Equipment)
Racks are enclosures that hold card cages, circuit card assemblies (CCA), power supplies, alarm/fuse panels, rack-mounted computers, and other electronic equipment. The SCT only knows about the cages in the racks; everything else is ignored. For convenience, the SCT assumes there is only one rack per site which contains all the cages. In reality, the cages can be split among many racks; the number of racks varies per basic system configuration.

RAM Random Access Memory

RAPCON Radar Approach Control

RCN ENBL Reconfigure Enable

RCT Remote Configuration Terminal

REL Release

RF Radio Frequency

Ring
The conductor which connects to the RING of a standard telephone plug.

RPIU
Remote Position Interface Unit. Local, remote, split, non-split positions. Used to interface split and non-split positions located more than 500 feet of cabling from the central rack equipment.

RX Receive

SAP System Alarm Panel

SAT Site Acceptance Test

SB Slow-Blow (type of Fuse)

SCT Supervisor Configuration Terminal

SCU
System Configuration Utility. This is a menu-driven program and the user operates the program by selecting the appropriate items from the menus. With the exception of checking for system faults, all functions are activated as a response to a direct response (selection) by the user. System polling (checking for system faults) is performed automatically by the program.

SEL Select

SF Single Frequency

SIIATD Site Installation Integration and Acceptance Test Document

Slot (Also see Card Cage)
A card cage slot holds a device. Devices slide in and out of slots. Each device has a unique slot address which is available off the backplane of the cage. For example, the slot numbers (addresses) identify the physical locations of various processor boards in the card cage.

SNIC
Subscriber Network Interface Circuit. A bi-directional device used to provide voice and control information to and from the positions. Referred to as an ISDN MT 8930. The SNIC provides point-to-point connection from the position electronics to the central rack equipment.

ST	Serial Telecommunications (Bus); also sidetone
STAT	Status

Status
Status information is associated with all processors (intelligent devices and positions), interface devices, and channels. The possible status values and meanings are:

Down	Processor did not respond to alarm panel poll, or interface is not responding to its processor, or processor has detected that a channel cannot be used because of link or interface failure.
Up	Functional and in normal running mode.
Standby	Processor is running and ready to take over if main fails.
Off-line	Commanded to an off-line (non-operational) state.
Diagnostics	Performing diagnostic test.

STI
Subscriber Terminal Input. A serial data stream. In ETVS, a 32-channel, 2.048-Mbps serial data stream used to input audio data to the Cross Point Switches (CPS). Provides interface from the Telephone Interface cards to the Conferencer board, and from the Maintenance Access Unit to the Operator Processor board.

STN Sidetone

STO
Subscriber Terminal Output. A serial data stream. In ETVS, a 32-channel, 2.048-Mbps serial data stream used to output audio data from the Cross Point Switches (CPS). Provides interface to the Telephone Interface cards from the Conferencer board, and to the Maintenance Access Unit from the Operator Processor board.

SVGA
Super Video Graphics Array. The TED/MBOP card file SVGA video card supports high-resolution color display

TDC Traffic Data Collection

TDM Time Division Multiplex—A method of data transmission where each data channel is assigned a specific time slot

TED Touch Entry Display

Telephone Card Cage
Card cage designed specifically to accommodate (hold) up to 16 4U height telephone cards. The hex switch (S1) and Jumper (W1) function in the same manner as those in the 5U card cages.

TIA Telecommunications Industries Association

TIMS Transmission Impairment Measurement Set

TL Transmit/Transmission Level

TLCSC Top Level Computer Software Components

TMU
Timing (Timer) Multiplexer Unit A unit which provides the system master timing and multiplexing functions for a single cluster. It has the capability of accepting Up-links from four Telephone Conferencer pairs and assigning each to a separate cluster.

TRACON Terminal Radar Approach Control

TRNEE Trainee

TS Time Slot (TS label on several CCA front panels)

TTS Transmission Test Set (Also referred to as TIMS)

TX Transmit

Up-Link
A 32-channel, 2.048-MHz serial data stream used to connect the cluster audio board outputs to their associated TMU/CMU.

UPS Uninterruptable Power Supply

VDB
Voice Data Bus. A parallel TDM bus holding all system audio data. In ETVS, an 8-bit, parallel, 512-channel bus operating at 4.096 Mbps. Only 480 channels are available to carry audio data. It is formed by the multiplex unit in each cluster for the audio boards in its cluster.

VDPRAM
Voice Data Conference List (Telephone Conferencer CCA)—Accessed by the board CPU and DSP. A dual port Random Access Memory on the Telephone Conferencer CCA used to store the digital voice channel data in contiguous conference lists. It is loaded from the Voice Data Bus and read by the Digital Signal Processor (DSP).

VOC Voice Operated Circuit (or Switch)

VOX Voice Activated Transmit; Voice Operated Switch; Voice Operated Circuit

XMIT Transmit

APPENDIX C

SYSTEM STANDARDS AND TOLERANCES

APPENDIX C.

SYSTEM STANDARDS AND TOLERANCES

C.1 INTRODUCTION

Appendix C (**Table C-1**) identifies and provides the operating signal levels and tolerances that are essential to the operation of the ETVS. **Table C-1** contains the system standards and initial/operating tolerances. **Table C-1** is divided into the following columns as defined below:

Column 1 - Identifies the specific signals (parameters).

Column 2 - Lists the optimum (standard) value of the signals.

Column 3 - Lists the initial tolerance/limit for each parameter.

Column 4 - Lists the operating tolerance/limit for each parameter.

Initial Tolerance/Limit: The maximum deviation above and below the standard value of a parameter, or the range, that will be acceptable or permissible at the time of initial ETVS installation or alignment that will be allowable after any modification or modernization, and that is desirable after any readjustment following an out-of-tolerance/limit condition.

Operating Tolerance/Limit: The maximum deviation above and below the standard value of a parameter, or the range, within which normal functioning can continue without adjustment or corrective maintenance, and beyond which remedial action by maintenance personnel is mandatory.

Table C-1. System Standards and Tolerances

Parameter (Notes 2, 3)	Standard	Tolerance Limit	
		Initial	Operating
1. Power			
a. Primary AC Input (Local/Central Equipment Rack)			
Voltage	240 VAC	204-276 VAC	Same as initial
Frequency	60 Hz	57-63 Hz	Same as initial
b. Primary AC	120 VAC	102-138 VAC	Same as initial
Input (Remote)	60 Hz	57-63 Hz	Same as initial
c. DC Power Supply Module (Remote Rack)			
AC Input			
Voltage	120 VAC	102-138 VAC	Same as initial
Frequency	60 Hz	57-63 Hz	Same as initial
DC Output	27.5 VDC (Factory Set)	+24 VDC to +28 VDC	Same as initial
d. DC Power Supply (Local-Central Rack)			
AC Input			
Voltage	240 VAC	204-276 VAC	Same as initial
Frequency	60 Hz	57-63 Hz	Same as initial
DC Output	27.5 VDC	+24 VDC to +28 VDC	Same as initial
e. Battery Voltage	24 VDC	+24 VDC to 28 VDC (Battery Power Cutoff to System 22.0 VDC)	Same as initial (Battery Power Cutoff to System 22.0 VDC)
f. Battery Reserve	20 minutes (min.)	Same as standard	Same as standard
2. 2-Wire PBX Telephone Line Interface (600/900 ohms)			
Transmit Level (Output) @ - 3TL (Note 1)	-13 dBm	-12.5 dBm to -13.5 dBm	-12 dBm to -14 dBm
Receive Level (Input) @ - 6TL (Note 1)	-16 dBm	-15.5 dBm to -16.5 dBm	-15 dBm to -17 dBm
Record Output Level	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm

Table C-1. System Standards and Tolerances (Continued)

		Tolerance Limit	
Parameter (Notes 2, 3)	**Standard**	**Initial**	**Operating**
3. 4-Wire PBX Telephone Line Interface			
Transmit Level (Output)	-10 dBm	-9.5 dBm to 10.5 dBm	-9 dBm to -11 dBm
Receive Level (Input)	-26 dBm	-25.5 dBm to -26.5 dBm	-25 dBm to -27 dBm
Record Output Level	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm
4. Handset/Headset (Designated 0TLP; MIC/Ear via Position Jackbox)			
Transmit Level (Output)	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm, to -11 dBm
Receive Level (Input) (Nominal level)	-26 dBm	-25.5 dBm to -26.5 dBm	-25 dBm to -27 dBm
5. ASU Telephone Line Interface (600/900 ohms) (Interfaces with 2-wire telephone set telephone lines) (Note 1)			
Transmit Level (Output) (-12 TL nominal) (Note 1)	-22 dBm	-21.5 dBm to -22.5 dBm	-21 dBm to -23 dBm
Receive Level (Input) (0TL nominal) (Note 1)	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm
Record Output Level (0TL)	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm

Table C-1. System Standards and Tolerances (Continued)

		Tolerance Limit	
Parameter (Notes 2, 3)	**Standard**	**Initial**	**Operating**
6. SS-1/SS-4 Telephone Line Interface (with tone signaling 4-wire telephone lines)			
Transmit Level (Output) (0TL nominal) (Note 1)	-10 dBm	-9.5 dBm to -10 dBm	-9 dBm to -11 dBm
Receive Level (Input) (-16TL nominal) (Note 1)	-26 dBm	-25.5 dBm to -26.5 dBm,	-25 dBm to -27 dBm
Dialing Tones			
Frequencies	2400/2600 Hz (0utput Signals)	2395 to 2405 & 2595 to 2605 Hz	2390 to 2410 & 2590 to 2610 Hz
Transmit Level	-8 dBm	-10 dBm to -6 dBm	-10 dBm to -6 dBm
7. Local Radio Interface			
Transmit Level (Output) (0TL nominal) (Note 1)	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm
Receive Level (Input) (0TL nominal) (Note 1)	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm
AGC	N/A	-25 dBm0 to +3 dBm0	-25 dBm0 to +3 dBm0
8. Remote Radio Interface			
Transmit (0TL nominal) (Note 1)	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm
Receive (-9TL nominal) (Note 1)	-19 dBm	-18.5 dBm to -19.5 dBm	-18 dBm to -10 dBm
9. Public Address (to Position Speaker)			
Transmit Level (0TL nominal) (Note 1)	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm
10. Legal Voice Recorder			
Transmit Level (0TL nominal)	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm

Table C-1. System Standards and Tolerances (Continued)

		Tolerance Limit	
Parameter (Notes 2, 3)	**Standard**	**Initial**	**Operating**
11. E&M Telephone Interface (Interfaces with dedicated services 4-wire voice call or SF E&M signaling)			
Transmit Level (0TL nominal) (Note 1)			
Interphone (LINCS) (0TL nominal)	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm
Receive Level (Note 1)			
Interphone (-16TL nominal)	-26 dBm	-25.5 dBm to -26.5 dBm	-25 dBm to -27 dBm
Interphone (LINCS) (0TL nominal) (Note 4)	-10 dBm	-9.5 dBm to -10.5 dBm	-9 dBm to -11 dBm
SF (Frequencies)	2400/2600 Hz (Output Signals)	2395 to 2405 or 2595 to 2605 Hz	2390 to 2410 or 2590 to 2610 Hz

NOTES:

1. The receive (input) and transmit (output) TL levels for the 2-W/4-W PBX, SS-1/SS-4, ASU, Radio (Local and Remote), and E&M interface cards are adjustable as follows:
   Transmit: +12TL to -16TL
   Receive: -16TL to +12TL

2. All numbers are based on a -10 dBm level at the jackbox. The impedance on all 4-wire devices is 600 ohms nominal. (Refers to Transmit only.)

3. All numbers are based on a -10 dBm @ the RCD output. (Refers to Receive only.)

4. SF Tone either 2600 Hz or 2400 Hz.

APPENDIX D

SYSTEM EXPANSION

APPENDIX D.

SYSTEM EXPANSION

D.1 INTRODUCTION

The ETVS system is designed to allow the site level maintenance technicians to add operator, telephone, and radio interfaces after the system has been installed. Each ETVS, regardless of its basic configuration, is pre-wired for the maximum number of interfaces allowed by its size. The addition of interfaces does not require that the ETVS be powered down, but does require a new global map to be sent before the interfaces will be recognized by the system. The process of adding interfaces is summarized by the following steps:

1. Determine the location of a spare slot for the candidate interface;
2. Remove the blank panel;
3. Configure the new interface for the desired options (i.e., set the straps);
4. Insert the new interface into the card cage;
5. Connect the external radio, telephone, or operator demarcation point to the device;
6. Configure the SCT for the new device by adding the device to the physical configuration and adding the new device to local maps, as needed; and
7. Send a global map to activate the new configuration in the ETVS.

D.2 Locating a Spare Slot

The technician should locate a pre-wired, spare slot for the interface by consulting the card map layout or wiring diagram and the SCT physical configuration. The first step is to locate the slot for the type of interface to be installed. Referring to the card map provided in the site's E02a document most easily does this. This card map shows the installed and spare locations for each type of interface card as the ETVS was originally installed. The slot to be used for expansion does not need to be sequentially located. In fact, specific designs or preferences in the demarcation panel's wiring may dictate that unused slots be skipped in sequence to allow for a group of radio frequencies (for instance) to be located on the same punch block. The SCT's physical configuration map should also be consulted to verify that the slot is indeed available for use.

In the absence of the card map diagram, the wiring diagram can be used to locate candidate slots for expansion. While slightly more difficult that just referring to the single-sheet card map, this method is just as reliable. The technician in this case must

identify the interface slots in the various pages of the wiring diagram and then determine if the slot is unused by inspecting the rack itself.

Regardless of the method used to locate a spare slot and install an expansion interface, the technician should update the appropriate site documentation as required by the user's procedures or orders. Candidate slots for the operator, telephone or radio interfaces are shown on the card map by words "OP xx" for operators (where the "xx" is the sequential number of the operator), "TEL" for telephones, and "PrRad/BakRad" for radios. These words appear on the first row of each slot on the card map and should show the word "Blank" in the third row of the slot if the slot is available for expansion. If the slot is labeled "Blank" in all three rows of the card map, the slot is not wired for use and should not be used for site expansion. The card map also shows the common equipment installed in the rack including the location of the TMUs, CMUs, Conferencers, High Speed Data Links, etc.

If new telephone interfaces are added to a card cage where no conferencer has been installed, then the technician will need to install a conferencer pair to control the interfaces. One conferencer pair controls up to thirty telephone interfaces. Conferencer pairs are installed in specific locations shown in the card map. The wiring diagram will confirm which conferencer pair controls which card cages by showing the connection of the local ST-bus from the telephone card cage to the conferencer pair.

If the new interface is installed in a slot not already served by a CMU, the technician will need to install a CMU pair, as well. One CMU pair can control up to thirty operator or radio audio channels. The wiring diagram will also confirm which CMU pair controls which slots in the ETVS by showing the connection of the local ST-bus from the card cages to the CMU pair.

D.3 Removing the Blank Panel

Once a candidate spare slot has been located and the technician has verified it is available for use (no previous assignment in the SCT physical configuration map), the blank panel may be removed from the card cage using a Phillips screwdriver. Care should be taken to ensure that the two small screws securing the blank panel are not dropped into the equipment. The blank front panel should be stored or disposed of as required by the site's procedures or orders. In some installations, a large blank panel may be installed in a card cage instead of a number of single blank panels. In this case, the large blank will have to be removed and single blanks will have to be installed in the remaining unused slots.

D.4 Configuring the New Card

Before the new card is installed in the rack, the technician should set the individual interface straps as needed for the particular installation. The strap settings are provided in **Section 6.6.5** for each type of card used in the ETVS. Failure to properly set the straps to the interface's requirements may prevent the interface from operating correctly or result in incorrect or intermittent operation.

D.5 Inserting the New Interface

Once the technician is satisfied that the interface's strapping options are correct, the interface may be inserted into the rack. No special tools are required for insertion or removal of ETVS interface cards. The technician should place sufficient force on the handle of the interface to insert it firmly into the card cage. The interface should never be slammed into the card cage or just slightly pressed into the slot. A firm, but gentle insertion action is all that is needed.

D.6 Connecting the External Interface

The three types of interfaces used in system expansion have different wiring and termination requirements. The operator interface only connects to ETVS position equipment and uses specific cables between the distribution panels and the position for both power and ISDN connections. No demarcation panels are usually found in these connections. Radio interfaces are connected through a distribution panel in the rear of the ETVS and through demarcation panels sometimes consisting of punch blocks. The Customer Furnished Equipment (CFE) is connected to the demarcation panels and is sometimes located some distance away from the ETVS equipment. The radio interface connections do not pass through any secondary lightning protection equipment located in the ETVS racks. The telephone interfaces, of which there are five types, are connected through lightning protection devices and demarcation panels. Different from the radio and operator interfaces, there are no telephone distribution panels located inside the ETVS racks, however. The lightning protection cards act as the distribution point inside the ETVS rack.

The technician should wire the operator, radio, or telephone circuit to the distribution point as required by the specific interface. If the technician is unfamiliar with the wiring, pin-out, or use of any interface being installed, second level support should be consulted before proceeding. Because incorrect connection of wiring to the ETVS may

result in damage to the ETVS or CFE, the technician must be thoroughly familiar with the connection arrangement and use of the equipment.

D.7 Configuring the Device in the SCT

Before any newly added interface can be used, it must first be configured in the system map using the SCT. The three interfaces require different steps and procedures for activation. At the very least, the audio channel must be assigned to the physical slot and a unique name must be assigned to the circuit. Other programming and configuration may also be required depending on the type of interface being installed. The technician should consult the *SCT User's Manual* for instructions on its use. Because incorrect software configuration may result in disabling or interfering with one or more functions in the ETVS, the technician must be thoroughly familiar with the use and configuration of the SCT before attempting a system expansion. If the technician is unfamiliar with the use and operation of the SCT, second level support should be consulted before proceeding.

D.8 Sending a Global Map

The final step in installing new operator, radio, or telephone interfaces is to send a Global Map from the SCT to the ETVS to activate the configuration changes. Global maps contain the necessary information for the devices in the system to use and communicate with each other. Global maps may require an operator to re-activate a position's configuration resulting in a momentary (several seconds) interruption. The technician should coordinate the sending of Global Maps with the facility's management to ensure unplanned interruption does not occur. The process of sending Global Maps is described in the *SCT User's Manual*. The technician should ensure that the "positions only" check box in the send Global Map menu is not checked.